THE IRON TRADE REVIEW

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PIG IRON PRODUCTION

OVER TWO MILLION TONS IN JULY.

More Furnaces in Blast—Pig Iron Advances—Structural Material Active—Heavy Purchase of Spanish Ore.

Pig iron production during July, a 31-day month, was at the rate of 25,000,000 tons per annum. Coke and anthracite furnaces produced 2,088,620 tons, as compared with 1,929,929 tons in June, and for the first time since October, 1907, has the monthly pig iron output equalled 2,000,000 tons. The daily melt in July was 67,375 tons, against 64,331 tons in June, and the number of furnaces in blast was increased from 240 to 259. Stocks of pig iron are very low and are not increasing. At merchant and independent steel works' furnaces in the central west, stocks are declining at the rate of about 1,000 tons per day.

Record Pig Iron Production

The production of pig iron by Steel Corporation furnaces during July was approximately 1,030,000 tons, breaking by a considerable margin the record established in October, 1906, of 1,008,431 tons. Taking the Ensley and Gary plants into consideration, the corporation furnaces are now operating at a trifle over 92 per cent of maximum capacity.

Pig Iron

Interest still centers in basic pig iron. Eastern consumers who have bought heavily for shipment the remainder of the year and through the first quarter, are now sounding producers in the middle west for deliveries during the next five months, these inquiries totaling 25,000 tons. St. Louis reports the sale of 20,000 tons of southern foundry iron and 6,000 tons of charcoal, while an Ohio steel plant has purchased 6,000 tons of basic. New England consumers have been prominent factors in the market during the week, and have placed large tonnages with Buffalo and Virginia furnaces. Inquiries for deliveries extending through the first quarter and the first half of next year are numerous, but producers are not inclined to quote, anticipating higher prices than are now prevailing. Virginia furnaces are still holding No. 2 foundry iron at $14, although in all other centers, advances of from 25 to 50 cents a ton have been recorded.

Building Activity

Orders for structural steel placed during July approximate 150,000 tons of which the American Bridge Co. booked 50,000 tons. In the Chicago district the cost of fabricating and erecting has again been advanced, and is now $10 a ton above the low point of the year. The mills are flooded with specifications, and deliveries on many sections cannot be made in less than 90 days. Contracts placed during the week include 13,500 tons for a Kansas City bridge; new steel works in the Pittsburg district, 6,000 tons; addition to the Gary plant, 5,000 tons; and scattering orders totaling nearly 15,000 tons. Bids are being received for the new Pullman shops, 7,500 tons; a hotel in Chicago, 6,500 tons; Pennsylvania viaduct at Johnstown, Pa.; San Francisco buildings, 3,500 tons, while the construction work of the New York, Westchester and Boston will ultimately involve 20,000 tons.

Iron Ore

The purchase of 400,000 tons of Spanish ore for delivery to eastern furnaces during 1910, which is about 100,000 tons more than was sold to American furnaces for the current year, is of more than ordinary interest in view of the reduction in the duty on ore from 40 to 15 cents a ton. No additional tonnage of Cuban ore is available for shipment this year, although preparations are being made for heavy importation in 1910. Lake ore shipments for July are not all in as yet, but they will probably touch the six million-ton mark, notwithstanding the delays caused by washouts on the ranges. Duluth shipped 2,249,410 tons in July, which is a record for that port, and Conneaut established a new high mark, handling 1,250,034 tons.

Rails, Cars and Plates

Numerous orders for cars continue to be received, and the Pennsylvania railroad announces that its requirements, involving 8,000 cars, have largely been placed. Inquiries that are being figured on by car companies are estimated at 30,000 cars.

(Continued on page 238.)

METAL SCHEDULE

OF SENATE BILL ADOPTED WITH FEW CHANGES.

Important Features of New Tariff Administrative Sections—The Corporation Tax.

Washington, D. C., Aug. 2.—With the exception of the reduced rates on iron ore, and scrap iron and steel, substantially the senate bill rates for the metal schedule were agreed upon by the conference committee in the final report made to both houses of congress.

Notwithstanding the vigorous protests made by the iron ore producers in the middle west and northwest, the rate on iron ore, which was fixed at 25 cents per ton by the senate bill, was reduced to 15 cents per ton. The rate on scrap iron and steel which was fixed at $2.50 a ton by the senate bill, corresponding with the rate on pig iron, was reduced by the conference committees to $1 per ton. The provisions of the senate bill, carrying duties on chrome metal, tungsten and ferro-silicon, containing more than 15 per cent of silicon, at 15 per cent ad valorem, were agreed to by the conference. The only change made in the rates on beams, girders and other structural shapes was the introduction of one additional rate covering the higher grades, so that the rates appear in the new tariff at three-tenths and four-tenths of a cent per pound respectively, with the basket clause rate of 45 per cent ad valorem on structural steel fitted for use. The duty on tungsten ore was agreed to at 10 per cent ad valorem.

Substantial Decreases.

In the paragraph of the bill covering wire nails, the rates finally agreed upon for nails not less than 1 inch in length and not lighter than No. 16, wire gage, was fixed at four-tenths of a cent per pound, while those less than 1 inch in length and lighter than No. 16 was fixed at three-fourths of a cent per pound.

Other items in the metal schedule which show substantial decreases over

(Continued on page 236.)

THE WEEK IN IRON CENTERS

PITTSBURG.

Large Orders for Cars Placed by the Pennsylvania Railroad—Pig Iron Firm.

Office of THE IRON TRADE REVIEW, 510 Park Building, Aug. 3.

Considering the normally dull period of the year, the iron and steel market is being well sustained. July established new tonnage records of business booked, especially in sheets and steel bars. Tin plate orders are more numerous than usually expected at this period of the year and it is evident that the fruit and vegetable crops are likely to exceed early estimates. The independent companies are benefiting from this overflow business because of the curtailed operations of the largest maker by reason of the sheet and tin plate strike. In semi-finished steel, the shortage of the supply available to merchant buyers is becoming acute and tonnage of considerable size is not readily obtainable. The mills are sellIng billets cautiously, and where they have been disposed to add to this tonnage, higher prices have usually been made and accepted. Prices continue to advance. The leading interest is now quoting steel bars at 1.30c, Pittsburg, and plates and shapes at 1.40c. Following this action, one of the important independents advanced steel bars to 1.35c. Several structural and plate mills have been asking 1.45c, mill, for several weeks. Light rails have again been advanced $1 a ton. Indefiniteness as to some of the immediate car-building plans of leading railroad companies was set at rest by the official announcement of the Pennsylvania railroad that its first order would consist of 8,000 freight cars, most of which have been or are about to be awarded to different manufacturers. A new steel works, to be erected in the Pittsburg district, for a subsidiary of the Standard Steel Car Co., is of importance since that interest is now a large buyer of steel in the form of plates, shapes, slabs, etc.

Pig Iron.—Further price advances have been made in the pig iron market during the week. Both Bessemer and foundry grades are firm at higher quotations and basic is also stronger. Some selling of foundry iron for first half delivery has clearly shown the idea of sellers for forward shipment. Bessemer iron has been placed upon a $16, valley, basis. A sale of 1,000 tons to an eastern consumer was made at $16, valley furnace, and this transaction indicates the strength of the market in the east. Other small orders were also made at this price. Some off-Bessemer was sold at $15.75, valley. The Bessemer average for July was $15.469, equivalent to $16.369, Pittsburg, and the sales from which this average was derived were quite heavy. The June average was $15.23, valley, or $16.13, Pittsburg. In basic there has been considerable inquiry from the east aggregating 20,000 to 30,000 tons, which has come largely from brokers. One large inquiry has been exciting some local interest. A Canton, O., melter has asked for prices on 5,000 to 10,000 tons for last quarter and first half and is understood to have bought a part of this lot. Furnaces are not anxious to quote for extended deliveries. Another local steel company is inquiring for its future requirements. The market is quoted at from $15.25 to $15.50, valley. The basic average for July was $15, valley, or $15.90, Pittsburg, compared with $14.94, valley, or $15.84, in June. Considerable quiet buying of foundry iron has been done by consumers covering the balance of the year and into 1910. One selling interest has disposed of 15,000 tons in the past few weeks, and some of this was taken at $15.50 valley. Several sales of foundry iron for delivery over the first half were made this week, one for 1,000 tons and the other for 800 tons of No. 2, at a price equvalent to $16.50, valley, or $17.40, delivered in immediate Pittsburg territory. For prompt and third quarter shipment on northern iron, we quote as follows:

Bessemer, valley	$16.00
Bessemer, Pittsburg	16.90
No. 2 foundry, Pittsburg	16.40
Gray forge, Pittsburg	**14.90 to 15.15**
Basic, valley	15.25 to 15.50
Basic, Pittsburg	16.15 to 16.40

Ferro-Alloys.—A fair buying of ferro-alloys is current, being chiefly in ferro-manganese and 50 per cent ferro-silicon. There are inquiries out for about 300 tons of 50 per cent ferro-silicon for last half shipment to local consumers. Considerable of this alloy is now being imported and some low prices are being made.

We quote ferro-manganese at from $41.50 to $42, Baltimore, present duty, prompt shipment, or for delivery this year and the first half of 1910, $42.50 to $43.50, Baltimore. The freight from Baltimore to Pittsburg is $1.95.

Fifty per cent ferro-silicon is quoted at $62.50 to $63.50, Pittsburg, on forward deliveries, at present duty; domestic, 12 per cent, $25; 11 per cent, $24; 10 per cent, $23, Pittsburg.

Plates.—The Pennsylvania lines east have closed for 2,950 freight cars consisting of 1,100 hoppers, 1,000 steel coke and 850 box cars. Of this lot, the Pressed Steel Car Co. was awarded 350 box cars, 350 hoppers and 500 coke cars; the Standard Steel Car Co., 750 hoppers; the American Car & Foundry Co., 500 box cars and the Cambria Steel Co., 500 coke cars. In addition, the lines west are in the market for 3,155 cars. It is also officially stated that the road itself will build 1,895 cars in its Altoona shops. For the cars awarded the Pressed Steel Car Co. and the Standard Steel Car Co., the Carnegie Steel Co. will furnish about 20,000 tons of steel. The New York Central railroad has also awarded 2,400 box cars which have been divided between the Standard Steel Car Co. and the American Car & Foundry Co. Including the Pennsylvania's purchase, it is estimated that a total of 30,000 cars, in live inquiries, are in the market. The largest of these is the Baltimore & Ohio lot, about 5,000 cars, which is still pending. Plate prices have again advanced and the minimum is now being quoted by the Carnegie Steel Co., 1.40c, Pittsburg. Some of the independent companies are asking 1.45c, mill. Specifications are heavy. The Standard Steel Car Co., having settled its strike, is again ordering freely, and the Pressed Steel Car Co. is also specifying better. We quote as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.40c to 1.45c, mill. Extras are as follows per 100 pounds: Boiler and flange steel plate, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The tonnage of sheets entered by the leading interest during last month was the heaviest of any July in its history and the largest

month since April, 1907. This record reflects the general conditions in sheets which are very sound and are being favorably sustained despite the summer season. Prices are quite firm but there is some weakness in the west where some independents have been making concessions. There has been considerable buying of corrugated sheets in this territory. The American Sheet & Tin Plate Co. this week is running 137 mills, or 76 per cent of serviceable capacity, compared with 134 mills last week. The independents are operating at about 92 per cent of capacity. We quote present sheet prices as follows:

Blue annealed sheets, Nos. 10 and heavier, 1.60c; Nos. 11 and 12, 1.65c; Nos. 13 and 14, 1.70c; Nos. 15 and 16, 1.80c; box annealed sheets, Nos. 10 to 12, 1.85c; Nos. 13 and 14, 1.90c; Nos. 15 and 16, 1.95c; Nos. 17 to 21, 2c; Nos. 22 to 24, 2.05c; Nos. 25 and 26, 2.10c; No. 27, 2.15c; No. 28, 2.20c; No. 29, 2.25c; No. 30, 2.35c; galvanized sheets, Nos. 13 and 14, 2.25c; Nos. 15 and 16, 2.40c; Nos. 17 to 21, 2.50c; Nos. 22 to 24, 2.65c; Nos. 25 and 26, 2.85c; No. 27, 3.05c; No. 28, 3.25c; No. 29, 3.40c; No. 30, 3.65c; painted roofing sheets, $1.55 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $2.80 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—Some of the canning companies have underestimated their requirements for the season's fruit and vegetable pack as the crop appears to be quite large, and additional orders for tin plate are being placed. Considerable of this business which is for comparatively prompt shipment, is being entered with the independents because of the curtailed operations of the largest producer. An order for 15,000 boxes was divided this week among different independents. The mills of the independent tin plate makers are generally booked to capacity and their operations are better than 90 per cent of their plant equipment. The strike against the American Sheet & Tin Plate Co. shows little change. The company has put on additional hot mills at its American, Greer, Shenango and Sharon plants and this week is running 118 hot mills, or 44 per cent of capacity, compared with 113 mills last week. All the independent companies whose plants are unionized have now signed the scale. Tin plate prices are firm and we quote the present market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.45 f. o. b. mill, Pittsburg district, and $3.40 in large lots. Terms 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The rail mills of the local makers have entered August with a fair tonnage, and their operations in the present month promise to be better than at any time since the depression. The filled-up condition of western mils, especially on Bessemer rails, continues to result in western roads buying in this district. Heavy specifications on contracts are being received from steam lines, tractions, frog and switch companies and other users, and some promising orders are under way. Light rails have again been advanced $1 a ton and orders are heavy. The Carnegie Steel Co. entered 2,600 tons during the week. Track fastenings are in good demand. Prices on spikes are firmer. We quote the market on Bessemer rails as follows, the prices on standard open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 8-pound, $31; 12-pound, $30; 16 to 25-pound, $29; 30 to 35-pound, $28.75; 40 to 45-pound, $28; angle splice bars for standard sections, 1.50c Pittsburg; standard spikes, 1.65c to 1.70c Pittsburg; hand spikes, 1.65c to 1.75c Pittsburg.

Steel.—One of the large makers of semi-finished steel had occasion to thoroughly test the market the past week and sold round tonnages of Bessemer rolling billets at $25, Pittsburg, and open-hearth rolling billets at $26, Pittsburg. Offers of forging billets at $29 Pittsburg were declined by this interest. Semi-finished steel continues very scarce and the mills are generally declining to accept much additional tonnage. There is very little free tonnage in sheet bars to be had and makers are asking $26 mill.

Bessemer 4 x 4 billets with 0.25 carbon and less are regularly quoted at $24.50 to $25.50, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $25.50 to $26.50, Pittsburg. Forging billets are held at $27.50 to $29, Pittsburg. Sheet and tin bars are quoted at $26, Pittsburg.

Hoops and Bands.—The hoop market shows some improvement, as more business is being entered and prices are slightly firmer. The large consumers are inquiring for extended requirements and are expected to place contracts soon. Specifications largely from miscellaneous sources are good. We quote the market as follows:

Hoops in carload lots, 1.40c to 1.50c; in less than carload lots, 1.60c; bands, 1.25c, base half extras as per standard steel.

Merchant Bars.—The minimum price on steel bars has been established at 1.30c, Pittsburg, the Carnegie Steel Co. having announced an advance of $1 a ton. The Republic Iron & Steel Co. has advanced its price from 1.30c to 1.35c, Pittsburg, and other independents are taking similar action. Heavy specifications in bars are being taken by the mills and considerable new business is offered. The July tonnage of the largest producer was the heaviest of any month since early in 1907. Contracts are being taken not to exceed 90 days. While considerable material has been taken for stock, it is evident that consumption is increasing very favorably. The bar iron trade continues to show improvement and new buying is better than it has been for months. Prices are advancing. Many orders are being entered in shafting and discounts are being well maintained. We quote the present market as follows:

Common iron bars, 1.45c to 1.50c, Pittsburg; Bessemer and open-hearth steel bars, 1.30c to 1.35c; plow and cultivator, 1.30c to 1.35c; channels, angles, zees, tees, under 3-inch, 1.40c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 60 per cent in carloads and 55 per cent in less than carloads, delivered in base territory. Planished and machine straightened tire is 1.50c base; iron finished tire under 1½ by 1½ inches, 1.45c, both plus ½ extra on tire card; iron finished tire, 1½ x ½ and over, 1.30c, plus ½ extra on the steel bar card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.05 on hard, and $3.30 on soft.

Structural Material.—The bookings of the American Bridge Co. during the month of July were about 50,000 tons, which is regarded as an excellent showing for a mid-summer period. New business is coming out quite well for this season, and fabricating prices after being at the bottom for many months are beginning to show a slight improvement. The Carnegie Steel Co. has advanced its minimum price on shapes from 1.35c to 1.40c, Pittsburg, while some of the independents are quoting 1.45c, mill. The McClintic-Marshall Construction Co. has been awarded the contract for a large bridge across the Missouri river, at Kansas City, for the Terminal Railroad

Co. This structure will require about 13,500 tons of steel. The bridge will be of a varied type of construction with a lift span. This concern will also fabricate and erect 6,000 tons for the new steel works of the Forged Steel Wheel Co., a subsidiary of the Standard Steel Car Co., at Butler, Pa. The new plant to be erected in this district by the General Chemical Co. will not take much tonnage as the buildings will be of concrete construction. We quote the market on structural shapes as follows:

Beams and channels, 15-inch and under, 1.40c to 1.45c; over 15 inches, 1.50c to 1.55c; zees, 1.40c to 1.45c; tees, 1.40c to 1.45c; angles, from 3 to 6 inches, 1.40c to 1.45c; over 6 inches, 1.50c to 1.55c; universal and sheared plates, 6¼ inches wide and wider, 1.40c to 1.45c.

Merchant Pipe.—No change in merchant pipe prices has been announced although the trade is expecting that such action will shortly be taken. A number of the independent companies are filled up on both small and large sized pipe for a number of weeks and are declining to accept much additional tonnage unless early specifications are guaranteed. Some makers of iron pipe are not disposed to quote on orders for shipment before October. The Union Petroleum Co., of Buffalo, which was inquiring for 60 miles of 8 and 10-inch steel line pipe for Canadian delivery, has purchased second hand goods. We quote the following official discounts on merchant pipe subject to an additional one point and five off to jobbers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	72	56	67	..
⅜ inch	73	59	68	54
½ inch	76	64	71	59
¾ to 6 inch	80	70	75	65
7 to 12 inch	75	60	70	53
PLUGGED AND REAMED.				
1 to 4 inch	78	68	73	63
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch.....	65	53	60	48
½ to 4 inch.....	72	60	57	55
4½ to 8 inch.....	68	56	63	51
DOUBLE EXTRA STRONG PLAIN ENDS.				
⅛ to 8 inch.....	61	50	56	45

Boiler Tubes.—The market in boiler tubes is still inactive, although there has been quiet buying of both merchant and locomotive tubes, and some makers report a very fair tonnage entered in July. There is some irregularity in prices. We quote the following official discounts on lap-welded steel boiler tubes to jobbers in carloads:

1 to 1½ inch	50
1¾ to 2¼ inch	62
2½ inch	64
2¾ to 5 inch	70
6 to 13 inch	62

2½ inch and smaller, over 18 feet, 10 per cent net extra.
2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

We quote the following official discounts on charcoal iron tubes to jobbers:

1 to 1½ inch	45
1¾ to 2¼ inch	45
2½ inch	50
2¾ to 5 inch	57
6 to 13 inch	45

Wire Products.—The recent advance of $2 a ton in wire products has temporarily checked new buying, although some business has been closed on the new basis. Consumers generally are well covered for their future requirements at the low prices formerly prevailing and are specifying freely. Present prices, which apply to specifications within 60 days, are as follows:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 30c for galvanizing; plain wire to jobbers in carloads, $1.60, and to retailers in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.10.

Wire Rods.—An official advance of $2 in wire rods has not been posted, but makers will not accept contracts at the former figure. We quote the market at advanced prices of $31 Pittsburg on Bessemer and $32 Pittsburg on open-hearth rods.

Coke.—While the offerings of spot coke, which have been the main source of low prices in the market, do not appear so plentiful, conditions are not showing much improvement. Material is still available at bargain figures, especially furnace coke, and the Connellsville region appears to be suffering from a period of over production. Labor shortage in the region is still causing considerable annoyance. The Jamison Coal & Coke Co. has advanced its price on foundry coke to $2.35 ovens on contracts up to July of next year. There is an inquiry out for 10,000 tons of foundry coke for Cincinnati territory. The proposed coke merger has shown no definite developments. We quote spot furnace coke at from $1.50 to $1.60, ovens, and on contract from $1.65 to $1.75, ovens, according to grade. On first class Connellsville foundry coke, the range is from $1.80 to $2, ovens, for prompt shipment, and on contract from $2 to $2.25, ovens. The *Courier's* figures for the week ending July 24 show 30,274 ovens active with an output of 385,452 tons, compared with 30,129 active ovens and a production of 384,425 tons the previous week.

Old Material.—The mills are manifesting a desire to buy more freely at lower prices but the dealers are bullish and are not inclined to make concessions to secure business. This condition is holding the market rather quiet but strong in tone. The bar iron producers are making more liberal purchases at higher prices. The Pennsylvania lines west this week disposed of their monthly offering of about 1,800 tons of long rails and a shop list of about 1,500 tons. On rails, a price of $17 delivered was obtained, and on heavy steel $16.35. We quote gross tons, delivered in the Pittsburg district, as follows:

Heavy melting scrap, $15.75 to $16.25; rerolling rails, $16.50 to $17; bundled sheet scrap, $14 to $14.50; iron axles, $23 to $24; old iron rails, $18.50 to $19; No. 1 wrought scrap, $16 to $16.50; old car wheels, $16 to $16.50; low phosphorus, $19 to $20; machine shop turnings, $11.25 to $11.75; cast borings, $9.25 to $9.75; No. 1 cast scrap, $15 to $15.50; malleable, $15 to $15.50; stove plate, $12 to $12.50.

CHICAGO.

Heavy Inquiry for Rails—Billets Scarce and in Demand.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Aug. 3.

There is a lull in the market for raw material which is as much due to the reluctance of makers to push sales, as to the unwillingness of consumers to buy for future requirements. At the same time, there is quite an active inquiry for small lots, which gives the market an unmistakable feeling of strength. Some movement in speculative pig iron has taken place. In finished material the situation is very strong. Billet makers are very firm in their attitude, and are out of the market for the present. Steel rails have been active, and an addition of 5,000 tons was made to the Harriman order given to the leading interest. Inquiries from the Burlington and the Baltimore & Ohio cover 26,000 and 7,000 tons, respectively, for this year's delivery. Contracting firms are becoming very urgent in their requests for immediate delivery of fabricated material, and the situation has reached the point where makers are not promising deliveries before Dec. 1, if they have to depend upon mills for material. The gradual accumulation of strength in this line is evidenced by the fact that prices for fabricated material are now $10 per ton higher than the lowest point of the year.

Pig Iron.—The leading feature in this week's market is the movement of some speculative lots of southern iron. A re-sale of 3,000 tons is one of the transactions, and another lot of 2,000

tons of No. 2 foundry was purchased at $13, Birmingham, for December delivery. It may be said that the inquiry for southern pig has fallen off a trifle, but this has not affected the strong tone which has characterized this market, and the best prices seem to be $13, Birmingham, except for spot delivery, on which $12.50 can still be done. There has been a fear that an unhealthy boom in southern iron might be inaugurated, but there is a tendency to move with caution to avoid such an undesirable condition. A very favorable feature this week is the presence of an active small-lot inquiry, which appears to be quite pronounced. One of the largest transactions of the week is the sale of 6,000 tons of northern No. 2 foundry, for delivery during the first half of next year, on a basis of $17.50, Milwaukee. A sale of 2,000 tons of Wellston iron was made to the American Car & Foundry Co., on a basis of $14.50, furnace, but the price was immediately withdrawn and an advance made to $15, furnace, on future business. An inquiry has been made by the Allis-Chalmers Co. for 1,000 tons of No. 2 foundry for its Cincinnati plant. A fair number of inquiries are being received for the first quarter of 1910, and one local furnace interest is quoting $17.25, furnace, but no efforts are being made to push sales for next year. We quote for Chicago delivery, as follows:

Lake Superior charcoal	$19.50 to 20.00
Northern foundry No. 1	17.50 to 18.00
Northern foundry No. 2	17.00 to 17.50
Northern foundry No. 3	16.50 to 17.00
Southern foundry No. 1	17.85
Southern foundry No. 2	17.35
Southern foundry No. 3	16.60
Southern foundry No. 4	16.10
Southern No. 1 soft	17.85
Southern No. 2 soft	17.35
Southern gray forge	15.85
Southern mottled	15.60
Southern silveries, 4 per cent silicon	17.35 to 17.85
Southern silveries, 5 per cent silicon	17.85 to 18.35
Southern silveries, 6 per cent silicon	18.85 to 19.85
Jackson Co. silveries, 6 per cent.	19.90
Jackson Co. silveries, 8 per cent.	20.90
Jackson Co. silveries, 10 per cent	21.90
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	17.65 to 17.90
Alabama basic	16.85 to 17.35

Billets.—The inquiry for billets has been quite active, and some good tonnage has been placed. Forging billets are in good demand, with the tendency of prices upward. One lot of 10,000 tons of axle billets was taken by the leading interest here, for September and October delivery. Another local concern is out of the market on billets, and declined to quote on an inquiry from an axle forging company for 5,000 tons, although offered an advance of $2 to $3 per ton. The advanced price for wire rods, noted last week, is being firmly adhered to, and it is claimed by manufacturers that not a pound is being sold for less. Forging billets remain firm at $28, base, Chicago, while rolling billets continue to command $26 to $27.

Merchant Bars.—The tone in this line is decidedly firmer, and the market is described as being on the border of a runaway condition. Mills are falling behind in their efforts to keep pace with specifications, the leading producer being three months behind, while another is from six to eight weeks behind. The Republic Iron & Steel Co. is operating three continuous mills at its Brown-Bonnell plant, and is figuring on increasing the capacity of that plant by erecting two additional mills. During July, bar specifications received by the leading interest amounted to 50,000 tons, breaking all previous records. The above tonnage represents three months' output. Bar iron is fractionally higher, the minimum quotation being 1.37½c, Chicago, which is only done on desirable business. New contract tonnage is very good, and specifications are being freely received, especially from car builders and the railroads. The best delivery promised by local mills is one month. We quote, for Chicago delivery, as follows:

Bar iron, 1.37½c to 1.40c; hard steel bars, 1.35c to 1.40c; soft steel bars and bands, 1.43c to 1.48c, half extras; soft steel angles, less than 3 x 3, 1.58c, half extras; hoops, 1.63c to 1.68c base, full extras; planished or smooth finished tire steel, 1.63c to 1.68c; iron finish, up to 1½ x ½ inch, 1.63c base, tire card; iron finish, 1½ x ½-inch and larger, 1.43c to 1.48c base, steel card; channel for solid rubber tires, ¾ to 1 inch, 1.93c to 1.98c; and 1⅛ inch and larger, 1.83c to 1.88c; smooth finished machinery steel, 1.73c; flat sleigh shoe, 1.53c; toe calk steel, 2.03c; spring steel, 2.08c; crucible spring steel, 2.58c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 60 per cent off the list for carload lots, and 55 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.70c to 1.80c, base, full extras; soft steel bars, 1.60c per 100 pounds base, plus half extras; soft steel hoops, 2.20c, full extras.

Plates. — While specifications for plates may not be quite so pressing, there is still a very good tonnage, and the local mills find much difficulty in keeping within from four to six weeks of their orders. The leading interest reports a heavy tonnage of universal plates, and specifications from car companies continue heavy. Prices remain firm, and we quote for Chicago delivery, as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.58c. For extras see Pittsburg report. Store quotations are without change, as follows:

Tank steel, ¼-inch and heavier, up to 72 inches wide, 1.70c; from 72 inches wide to 95 inches wide, 1.80c; 3/16-inch up to and including 60 inches wide, 1.80c to 1.85c; 72 inches wide, 2.05c to 2.10c; No. 8 up to 60 inches wide, 1.80c to 1.85c. Flange and head quality, 25c extra.

Sheets.—An advance in price of $2 a ton above Pittsburg has been announced by the Inland Steel Co., making 1.70c for No. 10, or 1.88c, Chicago. Manufacturers are not exerting themselves to secure new business, as specifications in hand will keep them busy for some time. Box annealed sheets remain firm at 2.20c, Pittsburg, for No. 28 gage.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents. We quote store prices at Chicago as follows:

No. 10, 2c to 2.10c; No. 12, 2.05c to 2.15c; No. 14, 2.10c to 2.20c; No. 16, 2.20c to 2.30c; Nos. 18-20, 2.50c to 2.55c; Nos. 22-44, 2.55c to 2.60c; No. 26, 2.60c to 2.65c; No. 27, 2.65c to 2.70c; No. 28, 2.75c to 2.80c; No. 30, 3.05c; galvanized sheets, Nos. 10 to 16, 3c to 3.10c; Nos. 18 and 20, 3.05c to 3.15c; Nos. 22 to 24, 3.20c to 3.25c; No. 26, 3.40c to 3.45c; No. 27, 3.60c to 3.65; No. 28, 3.80c to 3.90c; No. 30, 4.20c to 4.50c.

Structural Steel.—The present week has brought no relief to manufacturers of structural material in this territory, and all fabricating plants are full of work and waiting on the rolling mills for material. Specifications on contracts are coming in with a rush, and exceed the producing capacity, while the demand for early deliveries continues insistent. The Illinois Steel Co. reports that the situation on structural deliveries is growing worse and that its mills are from 10 to 12 weeks behind. The American Bridge Co. will not promise earlier delivery than December, if the material involved in the contract is dependent on delivery by the rolling mills. The market on fabricated material is at present $10 per ton higher than the lowest point this year, the price now being $46.40, Chicago. New tonnage is coming in steadily. Additions to the Gary plant of the Steel Corporation require 5,000 tons, while figures are being obtained on about 7,000 tons for the new shops of the

Pullman Co. The razing of the old Sherman House will begin Sept. 1, and bids are being asked for 6,500 tons for the new structure. Bethlehem shapes have been specified for 2,500 tons for a new bank building at Spokane, Wash. The contract for the Winner bridge, Kansas City, was let to the McClintic-Marshall Construction Co., Pittsburg, 13,500 tons; the Wisconsin Bridge Co. received the contract for a drawbridge at Houston, Tex., 243 tons; the Sioux City viaduct, 867 tons, went to the American Bridge Co.; the contracts for 155 tons for the Portland Gold Mining Co., Colorado Springs, Colo., and 350 tons for The Adolph Coors malting house at Denver, were secured by the Minneapolis Steel & Machinery Co.

We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.58c. For extras, see Pittsburg report. Local store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.70 per 100 pounds; angles over 6 inches, $1.80 per 100 pounds base; beams, 3 to 15 inches, inclusive, $1.70 per 100 pounds base; channels, 3 inches and larger, $1.70 per 100 pounds base.

Rails and Track Supplies.—A sale of 5,000 tons of rails as an addition to the Harriman order, is reported by the leading interest, which makes a total of 116,000 tons to be furnished by this concern. Inquiries are out for 20,000 tons for the Burlington system, and 7,000 tons for the Baltimore & Ohio, all for this year's delivery. The Illinois Steel Co. is sold up to December at its South Works, and to October at Gary.

See Pittsburg report for prices on standard sections. On light rails, Chicago delivery, we quote as follows:

Light rails, 40 and 45-pound, $26; 30 and 35-pound, $26.75; 16, 20 and 25-pound, $27; 12-pound, $28. In lots of 250 to 500 tons a reduction of 60 cents a ton from these prices is made; lots of 500 tons and up carry a reduction of $1 a ton. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.75c to 1.85c; smaller size spikes, 1.85c to 1.95c base; track bolts, with square nuts, 2.15c to 2.20c; with hexagon nuts, 2.30c to 2.40c.

Cast Iron Pipe.—Inquiry for pipe in small lots is very good, but there is no change in prices. The contract for 700 tons for Osage, Kans., was let last week. The United States Cast Iron Pipe & Foundry Co. is figuring on a good-sized lot of pipe for an irrigation plant at Laramie, Wyo. Cleveland, O., will let contracts for 2,000 tons, on Aug. 4, and Glasgow, Mont., for 500 tons, on Aug. 11. Prices are without change, as follows: Four-inch water pipe, $27.50; 6 to 14 inches, $26.50; larger sizes, $25.50; gas pipe, $1 a ton higher.

Wire Products.—Present indications promise a very heavy business in this line, especially in the nail trade. July shipments were very large, and deliveries to the south and southwest are unusually heavy, owing to the good crops, while jobbers in the northwest are ordering large quantities, to take advantage of the favorable lake freight rates. The American Steel & Wire Co. will not quote further ahead than 60 days, on wire nails, and specifications must accompany the order. On plain and barbed wire, the leading interest is accepting contracts for delivery as far ahead as the first of the year. We quote Chicago delivery as follows:

Wire nails, jobbers' car lots, $1.98; retailers' carload lots, $2.03; retailers, less than carload lots, $2.13; painted barb wire, jobbers' carload lots, $1.98; retailers, carload lots, $2.03; with 30c for galvanizing; plain wire to jobbers, carload lots, $1.78; staples, $1.98.

Old Material.—This market has continued strong throughout the week, and while stocks are heavy, there is no sign of weakness anywhere along the line and the advance foreshadowed last week is shown in our prices this week, which are from 25c to 50c higher per ton. Quotations, gross tons, are as folows:

Old car wheels	15.75 to 16.00
Old iron rails	17.50 to 17.75
Rerolling rails (4 ft. and over)	15.75 to 16.00
Old steel rails (2 ft. and under)	15.50 to 15.75
Light section relayers, 45 lbs. and under subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	22.50 to 23.50
Frogs, switches and guards	14.50 to 14.75
Heavy melting steel	14.50 to 14.75

We quote, net tons, as follows:

No. 1 R. R. wrought	$13.75 to 14.00
No. 2 R. R. wrought	12.75 to 13.00
Arch bars and transoms	16.50 to 16.75
Knucklers, couplers and springs	13.50 to 13.75
Shafting	15.50 to 15.75
Iron car axles	18.75 to 19.00
Steel car axles	17.75 to 18.00
Locomotive tires	15.25 to 15.50
Dealers' forge	11.75 to 12.50
Pipes and flues	10.25 to 10.50
No. 1 cast, 150 lbs. and less	13.75 to 14.00
No. 1 busheling	11.50 to 11.75
No. 2 busheling	8.25 to 8.50
No. 1 boiler cut	9.50 to 9.75
Boiler punchings	13.25 to 13.50
Cast and mixed borings	6.25 to 6.50
Machine shop turnings	8.50 to 8.75
Railroad malleable	13.25 to 13.50
Agricultural malleable	12.00 to 12.25
Stove plate and light cast scrap	12.00 to 12.25
Angle bars, splices, etc. (iron)	15.75 to 16.00

CLEVELAND.

Demand for Foundry and Basic Iron Improves.

Office of THE IRON TRADE REVIEW, Browning building, Aug. 3.

Iron Ore.—It is extremely difficult to forecast the effect of the reduction in the duty on iron ore, from 40 cents to 15 cents per ton, although producers are generally of the opinion that foreign shipments this year will not be greatly increased. Nevertheless, it is certain that eastern furnaces will reduce the lake ores in their mixtures and will probably replace them largely by either Cuban or some other foreign product. At the hearing granted by the President to the ore producers at Washington, last week, J. G. Butler Jr. directed attention to the growing importance of the mines located in the east and south. The production of Alabama increased from 2,759,247 tons in 1900 to 4,039,058 tons in 1907. In 1907, New York produced 1,375,020 tons, as compared with only 441,485 tons in 1900. The production in New Jersey also increased from 344,247 tons in 1900, to 549,760 tons in 1907. Pennsylvania, while not a large producer of iron ore in 1904, when its tonnage was 1.4 per cent of the total production, increased its output in 1906 to 1.99 per cent. It was also pointed out that the iron ore industry is threatened with competition from Cuba and Canada, as well as from more remote countries. With iron ore on the free list, these imports will greatly increase, with a corresponding reduction in domestic output. Mr. Butler also called attention to the fact that when the iron and steel manufacturers appeared before the ways and means committee, each producer stated that he was willing to stand his share of the revision and reduction in the tariff. However, he felt that in its revision, the iron and steel business had been singled out because of its prominence. There have been few sales of ore during the past week, although many merchant furnace interests have, as yet, failed to cover their requirements. On base ores, with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—The demand for pig iron for delivery during the first half of next year is heavy, although furnace operators are not inclined to book tonnage at prevailing quotations. One independent steel plant has inquired for 20,000 tons of basic for shipment during the first six months of next year, while another is in the market for 6,000 tons. Several inquiries for foundry iron for forward shipment have also been made in lots ranging from 500 to 1,300 tons. Sales have

been limited almost entirely to small lots for delivery the remainder of the year. The market is now firmly established on a basis of $16 for No. 2, and for 1910, furnaces are asking an advance of 50 cents a ton.

No. 1 foundry	$16.50 to 16.75
No. 2 foundry	16.00 to 16.25
No. 3 foundry	15.50 to 15.75
No. 2 southern	17.10 to 17.35
Gray forge	15.50 to 15.75
Bessemer	16.65 to 16.90
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery	20.00

Coke.—For prompt shipment, prices remain unchanged, although for future delivery, the producers are asking an advance ranging from 15 to 25 cents per ton. We quote spot furnace coke at $1.60 to $1.65, ovens, and for delivery over a period of six months, $1.85 to $1.90 is asked. High grade, Connellsville foundry coke is held at $1.80 to $2.00 for immediate shipment, and $2.10 to $2.25 on contracts.

Finished Materials.—Steel bars are now firmly established on a basis of 1.30c Pittsburg, and several interests are asking 1.35c. Specifications are exceedingly heavy, many consumers anticipating their requirements through the remainder of the year. On rounds, one large steel manufacturer is unable to make shipment in less than four months, and on practically all merchant shapes, deliveries can not be made in less than 90 days. The American Shipbuilding Co. has closed a contract for another freighter, and the plates, amounting to about 2,000 tons, have been placed with the Carnegie Steel Co. Both plates and structural shapes are now held at a minimum of 1.40c, Pittsburg, while 1.45c is quoted by several interests.

Old Material.—The tone of the market has been very quiet during the week, and very little material has changed hands. Prices continue firm, and there is a tendency toward higher prices. We quote, f. o. b. Cleveland as follows:

Old iron rails	$17.50 to 18.00
Old steel rails (re-rolling)	15.50 to 16.00
Old steel rails (under 6 feet)	15.50 to 16.00
Old car wheels	15.50 to 16.00
Old steel boiler plate	13.50 to 14.00
Malleable iron (railroad)	15.00 to 15.50
Steel axles	18.50 to 19.00
Malleable iron (agricultural)	13.50 to 14.00
Heavy steel	15.00 to 15.50
Country mixed steel	13.00 to 13.50
Low phosphorus	16.00 to 16.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.50 to 15.00
No. 1 busheling	13.00 to 13.50
No. 1 machine cast	12.50 to 13.00
Iron axles	18.00 to 18.50
Axle turnings	11.00 to 11.50
Machine shop turnings	9.50 to 10.00
Grate bars	11.50 to 12.00
Pipes and flues	12.00 to 12.50
Tank iron	11.00 to 11.50
Hoop and band iron	9.00 to 9.50
Sheet iron	8.00 to 8.50
Wrought drilling	9.50 to 10.00
Stove plate	11.00 to 12.00
Cast borings	8.00 to 8.50

NEW YORK.

Large Tonnage of Foreign Ore Purchased—Heavy Bookings of Structural Material.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Aug. 3.

Iron Ore.—The principal feature of the eastern market has been the purchase of about 400,000 tons of Spanish ore for 1910 delivery, details of which are given in another column. No Cuban ore is likely to be available for merchant furnaces during the coming year.

Pig Iron.—While there is a very large inquiry still under negotiation in the east and numerous sales are being made at steadily advancing prices, there are indications that in this immediate district the market is slowing down to some extent and will probably show decreased activity during the month. This is due in part to the fact that recent heavy sales have covered the requirements of many of the larger consumers for several months ahead and in part to the higher level to which most producers have advanced their quotations, certainly in some instances with a view to making them prohibitive. The New England district has been a particularly active center of late; sales of the past week have been numerous, largely to general foundry, machine tool and textile manufacturing interests, and while calling for moderate tonnages for the most part have aggregated a good figure. Both Virginia and Buffalo irons have shared generously in this business. The former is still procurable on a $14 basis, but in the latter a sharp advance is noted and the general level is now $15.75 furnace, for early delivery and $16 for last quarter. Southern iron is nominally at $13.50, but is still selling at $13, Birmingham. Eastern Pennsylvania furnaces are holding on a basis ranging all the way from $16.25, production point, to $16.75, according to the tonnage already on books. Despite reports that basic is available in the Philadelphia district at lower figures, interests represented in this territory are holding firmly for $17, delivered over the balance of the year, and the large inquiry now current has not been placed because of inability to shade this figure. There has been some moderate selling of malleable. The Pennsylvania railroad business has been placed, the bulk of it going to a producer in the western part of the state which has a large accumulation. We quote, delivery at New York tidewater over the balance of the year, as follows:

Northern foundry No. 1	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	16.50 to 17.00
No. 2 southern foundry	16.75 to 17.25
Malleable	17.25 to 17.75
Gray forge	16.00 to 16.50

Ferro-Alloys.—There is a good inquiry for ferro-manganese, largely for western shipment, and the price is firm at $42 to $43, seaboard, for delivery over the balance of the year. Ferro-silicon is quoted at about $68, Pittsburg, for any delivery.

Structural Materials.—Bookings during the past month are estimated at 150,000 tons, of which about 50,000 tons was taken by the American Bridge Co. The business closed was almost entirely made up of small orders, which came out in large number and which are still making up practically all the activity current in the structural trade. The Atlantic and Pacific coasts are yielding a good volume of inquiry, but just at present little is coming from the interior; the San Francisco district is particularly active, as tenders are now being asked on a power station, a jail, two schools and a hospital, aggregating about 3,500 tons. The city and county hospital there, 2,500 tons, will probably go to the American Bridge Co. Structural prices are improving slowly, hardly in keeping with the mill advances; a large tonnage of steel is still to be delivered on low priced contracts and this condition is likely to continue through the year. In the local market an interesting feature is the inquiry of the New York, Westchester & Boston, a New Haven interest, for about 2,000 tons required for subway and heavy electric railway and highway bridges; eventually the requirements of this interest will run over 20,000 tons, but on this the delivery will run over such an extended period that current prices can hardly apply. Bids go in this week on a 600-ton highway bridge at Waterford and at an early date on 1,000 tons for the Second avenue car barns and on a station house and garage for the 13th precinct, 500 tons. The Germania Life Insurance Co. building at Fourth avenue and Seventeenth street, which is coming up at an early date, will be a large project, and an 800-ton apartment house on Clermont avenue will also be out soon. A. E. Norton has the steel contract for the Coleman building, 2,000 tons, on Fifty-second street. The American Bridge Co. has taken the Oleson office and loft building on Forty-fifth street, 900 tons; the National Tube Co. skelp mill at Lorain, 700 tons; and

some small bridges for the Illinois Central, 250 tons. The receivers of Milliken Bros. will supply 2,000 tons of steel for a store and office building on West Twenty-seventh street; Clarke & Stowe have the Kismet Temple in Brooklyn, 500 tons; the Boston Bridge Works will furnish 600 tons for the Dartmouth gymnasium; Levering & Garrigues have secured a 900-ton apartment on Riverside drive; the New England Structural Co. has booked a 300-ton bridge order for the Boston & Maine; and the Pennsylvania Steel Co. will supply 2,900 tons of bridge work for Oregon installation. With the advance announced by the leading interest, the price on structural shapes is now uniformly 1.56c, New York delivery.

Billets and Bars.—Two inquiries for billets now current aggregate about 5,000 tons. The demand is brisk, shipments are being delayed and a premium is procurable on good lots. Steel bars are being well specified and the price is now firm at 1.46c. Bar iron is quiet, the current quotation being 1.40c to 1.45c.

Cast Iron Pipe.—Brooklyn has a contractors' letting, Wednesday, which with fittings involves about 1,000 tons, principally 16 and 20-inch. The leading interest has secured orders for 765 tons at Syracuse and 650 tons at Mt. Morris, N. Y. M. J. Drummond & Co. will furnish about 350 tons for White Plains, and a small tonnage for the New York high pressure system is pending. Prices show but little improvement, though certain interests are holding out of the market.

Rails and Railway Material.—The Pennsylvania railroad has made important additions to its rail tonnage orders placed some months ago. The Pennsylvania Steel Co. has booked 800 tons of standard sections in the Boston district and a trolley road in Maine is in the market for 1,350 tons. The United Railways of Havana has taken prices on 25 tons, and the Osaka (Japan) municipal railway wants about 900 tons of girder rails. The Manila Railroad Co. is receiving bids on 10,000 tons of standard sections. Car orders include one of the Pennsylvania lines, east, for about 5,150, of which about 2,000 will be built at the Altoona shops and 1,200 by the Pressed Steel Car Co., 500 by the American Car & Foundry Co., 750 by the Standard Steel Car Co. and 800 by the Cambria Steel Co. The Baltimore & Ohio inquiry is still pending and the Brooklyn Rapid Transit is in the market for 2,000. Many smaller inquiries are reported.

Old Materials.—The price level is generally higher and the situation is stronger, with some activity in heavy melting steel, borings and pipe. The last named is particularly scarce and in brisk demand. Large lots of steel will bring top prices, but smaller tonnages are not active. Two cargoes of mixed scrap, classed as heavy steel, have arrived during the past few days from Yucatan; they aggregated about 800 tons and brought $14 on the dock. We quote, gross tons, New York delivery, as follows:

Old steel rails (rerolling)	$13.50 to 14.50
Relaying rails	19.00 to 19.50
Old car wheels	13.50 to 14.00
Old iron car axles	21.50 to 22.00
Old steel car axles	20.00 to 20.50
Heavy melting steel	14.00 to 14.50
No. 1 railroad wrought	15.00 to 15.50
Iron track scrap	13.00 to 13.50
Wrought pipe	13.00 to 13.50
Cast borings	8.00 to 8.50
Wrought turnings	10.00 to 10.50
Heavy cast scrap	12.50 to 13.00
Railroad malleable	11.50 to 12.00
Stove plate	10.00 to 10.50
Grate bars	10.50 to 11.00

CINCINNATI.

Southern Iron Advanced—Heavy Inquiry for Next Year's Delivery.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Aug. 3.

Pig Iron.—While business in pig iron during the week has been confined to sales of moderate tonnages, the situation has nevertheless gained strength and prices show an upward tendency. Southern iron is generally quoted on the basis of $13, Birmingham, for any delivery, although a little prompt iron and balance of third quarter is still obtainable at $12.50, Birmingham basis. An Ohio consumer, after testing the market for last quarter and first quarter of next year, bought 1,000 tons for August-September delivery at $12.50, Birmingham; but it is believed that this could hardly be duplicated today, as the furnace taking the order is now comfortably situated and would not likely take anything but small orders for immediate shipment at this price. This furnace has only recently gone into blast. Some of the leading producers in the south have either withdrawn from the market or put prices up to $13.50 for last quarter delivery, although there is still considerable $13 iron for last quarter available. The $13 iron on the market is, to a large extent, in the hands of dealers who purchased for investment, although some furnaces are still quoting $13. The disposition on the part of consumers is to cover requirements as far ahead as possible, and the persistent inquiry for prices for delivery in the first quarter and first half of next year, it is believed will result in the opening of order books by the furnaces for this period, although the southern furnaces are holding back on commitments for next year quite uniformly. A few quotations have been made at $13.50, Birmingham, for 1910, and it is believed that the furnace books will be opened on this basis. Northern iron is quotable at $15 for No. 2 foundry, at furnace in southern Ohio, for this year's delivery and at $15.50 for first quarter of next year. A considerable tonnage has been taken in the past two weeks at $14.50, furnace, but this price seems to be no longer obtainable. A little southern iron has been sold at $13.50 for first quarter and first half of next year, and one transaction of 500 tons for first half delivery at $13.50 is reported. Two inquiries from St. Louis dealers for southern pig iron calling for August and September deliveries, were regarded as evidence of the strength of the situation. We quote for prompt shipment and balance of third quarter, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows:

Southern foundry No. 1	$16.25 to 16.75
Southern foundry No. 2	15.75 to 16.25
Southern foundry No. 3	15.25 to 15.75
Southern foundry No. 4	14.75 to 15.25
Southern No. 1 soft	16.25 to 16.75
Southern No. 2 soft	15.75 to 16.25
Southern gray forge	14.25 to 14.75
Northern No. 1 foundry	16.70
Northern No. 2 foundry	16.20
Northern No. 3 foundry	15.70
Jackson county 6 per cent silicon	18.70
Jackson county 8 per cent silicon	19.70
Jackson county 10 per cent silicon	20.70

Finished Material.—Reports of advanced prices on finished lines by the leading interests were received here on Monday and some of the independents have also further increased prices. Specifications on contracts are liberal and the mills are behind on shipments on some lines.

Coke.—The market is firm in tone and there is more inquiry for furnace coke. Foundries are taking shipments more freely on their contracts. Inquiry for next year's shipment is increasing and the tendency to cover requirements far into the future is becoming noticeable in the coke market as well as in pig iron. There is no material change in prices and in the following table the inside quotations represent prompt shipment coke, while the outside prices prevail mainly on contract business. Quotations in the leading coke producing districts are as follows:

	Per Ton.
Wise county furnace coke	$1.60 to 1.85
Wise county foundry coke	2.00 to 2.25
Pocahontas furnace coke	1.65 to 1.85
Pocahontas foundry coke	1.75 to 2.25
Standard Connellsville furnace coke	1.60 to 2.00
Standard Connellsville foundry coke	2.00 to 2.25

Old Materials.—The market is not active and prices show only slight variations from last week. We quote dealers' prices as follows:

Old No. 1 R. R. wrought net tons	$14.00 to 14.50

No. 1 machinery, net tons	13.50 to 14.00
Old iron rails, gross tons	15.00 to 16.00
Old steel rails (re-rolling) gross tons	14.00 to 14.50
Old short lengths, gross tons	13.50 to 14.00
Old iron axles, net tons	17.00 to 17.50
Heavy melting scrap, gross tons	13.50 to 14.00
Stove plate, net tons	10.50 to 11.00
Heavy turnings, net	9.50 to 10.00
Cast borings, net tons	7.50 to 8.00
Car wheels	14.50 to 15.50

PHILADELPHIA.

Demand for Basic Continues Heavy—All Grades of Pig Iron Advance.

Aug. 3.

Pig Iron.—With a continuance of the brisk selling which characterized the past month, and a heavy volume of inquiry coming out all the while, the local iron market enters August in as strong condition as could well be imagined. The extent of the business booked so far this year may be understood from the fact that one large selling interest up to Aug. 1 had taken a tonnage equal to its sales for 11 months of last year. As has been the case right along, basic and foundry continue to share the chief activity and interest is still largely centered in the former. During the past ten days several large orders have been booked, principally at $16.25 and $16.50, delivered during the last quarter, but including one lot at $16, this being due to unusual conditions. In addition, sales for the first quarter of next year, made on a $17, delivered, basis, have aggregated between 35,000 and 50,000 tons. Two interests are negotiating for a total of 30,000 tons for last quarter delivery, on which offers of $16.50 are reported. One of these concerns has also inquired for round tonnages of Bessemer and low phosphorus iron. Sales of the former have been made into this territory during the week on a basis of $16 to $16.25, western Pennsylvania furnace, and two small lots of low phosphorus went at a price equivalent to $20, eastern Pennsylvania furnace. Sales of western charcoal iron have aggregated a good tonnage, the range being $19.50 to $20, Buffalo. Virginia producers are still selling as low as $14, furnace, and have made some important sales. Pipe irons now seem firm on a $16, delivered, basis. No. 2X foundry is selling briskly at $17 to $17.25, delivered over the balance of the year, or $17.50 to $17.75 for first quarter. One large basic interest is now holding at $17.50 for later delivery. Current inquiry amounting to 100,000 tons can easily be accounted for in this district. We quote, delivery at eastern Pennsylvania points over the balance of the year, as follows:

No. 1X foundry	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	16.50 to 17.00
Standard gray forge	15.75 to 16.25
Basic	16.50 to 17.00
Low phosphorus	19.50 to 20.50
No. 2 Birmingham	16.25 to 16.75
No. 2X Virginia	17.00 to 17.50
No. 2 plain Virginia	16.50 to 17.00

Finished Material.—In anticipation of further advances on shapes, plates and bars at an early date, mills are booking as heavily and for as advanced delivery periods as they desire at the full schedule, while specifications are coming out so briskly that many producers are out of the market except for remote shipments. Few structural projects are pending. The Fidelity Trust & Safe Deposit Co., Baltimore, will shortly put out plans for a 1,800-ton addition; the Pennsylvania is asking bids on a large viaduct at Johnstown to cross its own tracks and those of the Cambria Steel Co.; about 900 tons of bridges for Philadelphia are still pending; the American National Bank building at Richmond is still unsettled; the Casey-Grand hotel at Scranton promises an early decision, after several bidders have advanced their prices, and the receivers of the Norfolk & Southern are again taking bids on a pier shed and office building at Norfolk, 600 tons, contracts on which were originally awarded some time ago. The Perkiomen bridge order of the Reading, 700 tons, was divided among the Keystone, Phoenix and McClintic-Marshall interests. The Baltimore & Ohio is in the market for 25,000 or 30,000 tons of rails; its car inquiry is still pending. We quote structural shapes and plates, 1.55c to 1.60c; steel bars, 1.45c to 1.50c; bar iron, 1.45c to 1.50c; sheets, No. 28, 2.80c.

Old Materials.—Fair lots of heavy steel have sold during the week at $17, delivered, or slightly higher, and dealers are freely offering $16.50. The situation continues to gather strength, as it is not expected that the reduced tariff will permit any importation movement of importance. We quote, gross tons, eastern Pennsylvania delivery, as follows:

Old steel rails (rerolling)	$17.50 to 18.00
No. 1 steel scrap	17.00 to 17.50
Old steel axles	22.50 to 23.00
Old iron axles	24.50 to 25.00
Old iron rails	19.50 to 20.50
Old car wheels	15.50 to 16.00
Choice scrap R. R. No. 1 wrought	18.50 to 19.00
No. 1 yard scrap	17.50 to 18.00
Machinery scrap	15.00 to 15.50
Low phosphorus scrap	20.00 to 20.50
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	14.50 to 15.00
No. 2 forge fire scrap, ordinary	9.50 to 10.00
Wrought turnings	13.00 to 13.50
Axle turnings, heavy	14.00 to 15.00
Cast borings	11.00 to 12.00
Stove plates	12.50 to 13.00

BUFFALO.

Foundry Iron Advanced — Furnace Shipments Heavy.

Office of THE IRON TRADE REVIEW,
932 Ellicott Sq., Aug. 3.

Pig Iron.—There has been a decided stiffening in the market and interests which had been selling at $15 to $15.75 for No. 2X foundry, advanced their prices on all grades today on an average of 50 cents a ton. This advance came just as predicted and the whole tone in pig iron has strengthened. Foundries will find it difficult to secure terms and deliveries such as they had a month ago. The fact that many eastern furnaces turned to the production of basic iron apparently has had some influence on the Buffalo market and an increased call for foundry iron is felt. A number of furnaces have oversold and deliveries in such cases cannot be had until after Oct. 1. The output of the furnaces at this point is more than at any time in two years. Only one idle stack is reported here and that may be blown in at any time. The inquiry for charcoal iron has improved substantially the past week. A few weeks ago there was scarcely an inquiry for this grade of iron. Forward shipments are unusually heavy. One furnace moved double its normal output in one day the past week. We quote, prompt delivery, f. o. b. Buffalo, as follows:

No. 1X foundry	$16.00 to 16.50
No. 2X foundry	15.75 to 16.00
No. 2 plain	15.25 to 15.75
No. 3X foundry	15.00 to 15.25
Malleable Bessemer	15.50 to 16.00
Gray forge	15.00 to 15.25
Charcoal	19.50 to 20.50

Finished Product.—The market at this point is quiet, owing to the congestion of orders at the mills, and not for lack of tonnage offered. The offerings of the past week were of a substantial character, but the business was not accepted as deliveries could not be made according to specifications. One offering which was not closed included four cars of structural material for delivery within two months, but the interest referred to was so heavily booked that delivery could not be made as specified. One booking closed here was for 500 tons of bars and shapes and was in the nature of current business for the firm obtaining the order. A price of $1.40 on shapes and plates and $1.30 on bare, f. o. b. Pittsburg, prevails. There has been an advance here of $1 a ton on spikes. Activity is observed in cold rolled material for delivery in four and six weeks. Bids go in this week for 800 to 1,000 tons structural material to be used in the construction of the Rochester city hospital, delivery the latter part of 1909. This hospital building is a donation made by George Eastman of Rochester. In galvanized, corrugated and black sheets the inquiry has been constantly improving and advances in prices have occurred. Inquiries received by the leading manufacturers of this class of material here in-

dicate a decided betterment in the tone of the market.

ST. LOUIS.

Heavy Sales of Southern Iron—Prices Firm.

August 3.

Pig Iron.—Although a few buyers contend that they can purchase No. 2 foundry iron, as low as $12.50, Birmingham, it is pretty well understood that the market is firm in the St. Louis territory at $13, covering shipments the remainder of the year.

There may be some iron on the market at $12.50, but if so it probably is resale iron, and shipment at that figure would be for August and September delivery, but the last quarter is firm at 50 cents a ton increase, with some furnaces asking $13.50. Some of the producers are out of the market entirely. Sales were made in the St. Louis territory last week aggregating 20,000 tons of Southern iron. Another sale of 6,000 tons of car wheel iron was reported today as having been made for August and September delivery. One inquiry is out for 3,000 to 4,000 tons of foundry iron and still another for 2,000 tons of basic, all for November and December shipment. No sales are reported in this territory for 1910 delivery, but there is some inquiry out for shipment over the first half of next year. One dealer reports a sale of 1,000 tons of malleable last week at $15.50, for delivery over the first half of 1910, also a sale of 4,000 tons of gray forge. Northern iron is firm at $15 to $15.50, f. o. b. furnaces, for shipment up to July 1, 1910, and Virginia iron is firm at $15 for prompt delivery. Our quotations, delivered, to which the freight of $3.75 from Birmingham has been added, follow:

No. 1 southern	$16.75 to 17.25
No. 2 southern	16.25 to 16.75
No. 3 southern	15.75 to 16.25
No. 4 southern	15.25 to 15.50

Coke.—The market for coke is firmer than the preceding week, with 72-hour Connellsville foundry selling at $2.25 for delivery over the remainder of the year, and $2.40 for the better grades. For spot shipment, 72-hour foundry coke can be purchased as low as $2.15. Connellsville, 48-hour, furnace coke is offered at $1.75 to $2, ovens, for shipment to January 1. Virginia and West Virginia grades are bringing $2.25 to $2.50 for delivery over the balance of the year and the first half of 1910. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—The scrap iron market is stronger, with prices as follows:

Cast iron borings, free from foreign material, net tons	$ 5.00 to 5.50
Steel axle turnings, gross tons	11.00 to 12.00
Steel railroad axles, net tons	17.00 to 18.00
Iron railroad axles, net tons	18.50 to 19.50
Miscellaneous steel scrap, gross tons	10.00 to 11.00
Old car wheels, gross tons	15.00 to 15.50
No. 1 railroad cast scrap, net tons	11.00 to 11.50
Heavy machinery cast, net tons	13.00 to 13.50
Stove plate and light cast, net tons	10.00 to 10.50
Sheet iron, net tons, uncut	4.00 to 5.00
No. 1 railroad wrought, net tons	12.00 to 13.00
Railroad malleable, net tons	12.00 to 12.50
Heavy melting steel, net tons	11.00 to 12.00
Relaying rails, net tons	17.00 to 18.00

BIRMINGHAM, ALA.

Southern Iron Firm—Only a Few Alabama Stacks Are Idle.

August 3.

The Southern pig iron market presents a still stronger position as the new month sets in. Prices are still advancing, $13 being the minimum for No. 2 foundry, with $13.50 being asked. The furnaces in this section are not anxious to sell for the fourth quarter, being convinced that there will be an even better price than is now prevailing. The inquiries are numerous and indications point to a heavy consumption of iron. During the past month stocks have been steadily reduced. Two furnaces were put in operation last week, both belonging to the Tennessee Coal, Iron & Railroad Co., though one will not be making iron until about the middle of the week. Four furnaces in all were blown in during July and one put out, for repairs. The Williamson furnace was blown in this week. Two other furnaces are practically ready for the torch and will be started before the middle of August.

The Tennessee Coal, Iron & Railroad Co. has six furnaces in operation; the Sloss-Sheffield Steel & Iron Co., five; the Alabama Consolidated Coal & Iron Co., three; the Woodstock, Central and Birmingham Coal & Iron companies, one each; the Republic Iron & Steel Co. and the Woodward Iron Co., two each; the Shelby Iron Co., one (charcoal); the Bass Foundry Co., one (charcoal); a total of 23. The Southern Iron & Steel Co. should be ready to blow in one or two of its furnaces the latter part of this month.

The Tennessee Coal, Iron & Railroad Co. will operate its steel rail mill at Ensley on double turn, to fill the orders.

Announcement is made that the Sheffield cast iron pipe plant, which has been out of operation for nearly two years, will resume at once.

METAL MARKETS.

ST. LOUIS.

August 3.

Lead and Zinc.—While one carload of zinc was reported to have been sold in the Missouri-Kansas-Oklahoma district last week for $45, the price ranged from $44 to $44.50 for 60 per cent ore. Sales at $44 were more numerous than during the preceding weeks. A delay in loading ore was reported by some buyers as a result of a scarcity of cars at the mines. A shortage of cars at the Webb City mines was due to a freight wreck. A number of large producers have started up in earnest for the first time since the floods in the district, causing a slight improvement in the output, but the production probably will not be up to the average for several weeks. The highest price reported for blends was $47 on a base of $44. The St. Louis spelter market closed Saturday at $5.35. Lead ore prices showed improvement, $56 having been obtained last week for 80 per cent ore, with reports of better grades demanding more money. While $56 was paid during the preceding week, the price last week was much more general than it has been for some time. St. Louis pig lead was quoted strong at $4.20, Saturday. Calamine was unchanged, ranging from $20 to $24 a ton for 40 per cent ore.

CHICAGO.

Aug. 3.

Quite a lot of business was done in copper the past week, but in spite of this, the market lacks strength; casting copper is scarce, and prices are holding steady; spelter is weak, but tin is strong, in sympathy with the London market. We quote as follows:

Lake copper, carload lots, 13½c to 13¾c; casting copper, 13⅛c to 13¼c; smaller lots, ¼c to ¾c higher. Spelter, 5.35c to 5.40c; lead, desilverized, 4.35c to 4.40c in 50-ton lots; corroding, 4.60c to 4.65c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, $7.25 list f. o. b. LaSalle in car lots of 600-pound casks; pig tin, 31½ to 32c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—Business in old metals is improving, after something of a slump last week. Lead is weak and fractionally lower. We quote as follows:

Copper wire, 11¾c to 12c; heavy copper, 11½c to 11¾c; light copper, 10¾c to 11c; heavy red brass, 10¾c to 11c; heavy yellow brass, 8½c; light brass, 6¼c; No. 1 red brass borings, 9c to 9¼c; No. 1 yellow brass borings, 7¾c; brass clippings, 8¼c; tea lead, 3.40c; lead scrap, 3.80c; zinc, 3.60c; tin pipe, 24½c; tin foil, 23c; pewter, 17½c; electrotype plates, free from wood, 4c; electrotype dross, 2.90c; stereotype plates, 4⅛c; stereotype dross, 3c; prime slab zinc dross, $60 per ton.

NEW YORK.

Aug. 3.

Current prices of non-ferrous metals are as follows: Copper, Lake, 13¼c to 13½c; electrolytic, 12⅝c to 12¾c; casting, 12⅝c to 12⅞c; pig tin, 28½c; pig lead, 4.30c to 4.35c; spelter, 5.35c to 5.45c.

FOREIGN IRON ORE

For 1910 Delivery Purchased by Eastern Furnaces—Local Ores Advance.

Sales of Spanish iron ore, aggregating about 400,000 tons, for delivery at eastern furnaces during 1910, have been made by Sota & Aznar, whose London agent sailed a few days ago after a fortnight in this country. This block of ore, which is about 100,000 tons larger than that sold to American furnaces for the current year, is understood to comprise the entire allotment of this producer for 1910. The ore will go to practically the same plants by which it is now being used, chiefly in the Schuylkill and Lehigh valleys. The price is reported at 7¾ cents per unit, delivered at seaboard, duty paid, the ore running about 55 per cent in a dry state; this is an advance of ¼ cent over the price prevailing on the later sales of last year, or of ¾ cent if the advantage resulting from the pending tariff reduction is considered. The extent of this ore movement can be better understood from the statement that, counting the average cargo as 4,000 tons, two vessels must dock every week in the year to handle the aggregate. Sota & Aznar control considerable tonnage, which can be diverted to this traffic if necessary. This product, which is a concentrate screened to avoid fines, is commonly known as Sagunto ore.

The increase in activities at eastern Pennsylvania furnaces has resulted in a sharp advance in local ores, which have been mined in large quantities during the depression because of their brisk demand in piecing out lake ore tonnages and cheapening the mixture. Within three months there has been an advance from 6¾ to 7¾ or 8 cents per unit on those ores selling on the open market.

The Port Henry Iron Ore Co. has a number of important improvements under way at its Mineville, N. Y., workings. Chief of these is a new triple-compartment shaft which reaches the ore vein at a depth of about 540 feet; hoisting facilities will have a maximum capacity of 1,000 tons per day. A steel shaft house is being erected.

The first shipments have just gone forward from the workings at Benson mines, in central New York, where a large amount of development work has been done. Concentrates are now being shipped, and the nodulizing plant will be ready for operation by Oct. 1. These mines will have an annual capacity of considerably over 100,000 tons.

The new ore docks of the Philadelphia & Reading at Port Richmond (Philadelphia) will be able to handle 1,000,000 tons annually. The equipment will consist of two Brownhoist machines and the total expenditure will run close to $500,000.

RAIL ORDERS.

(Special Telegram.)

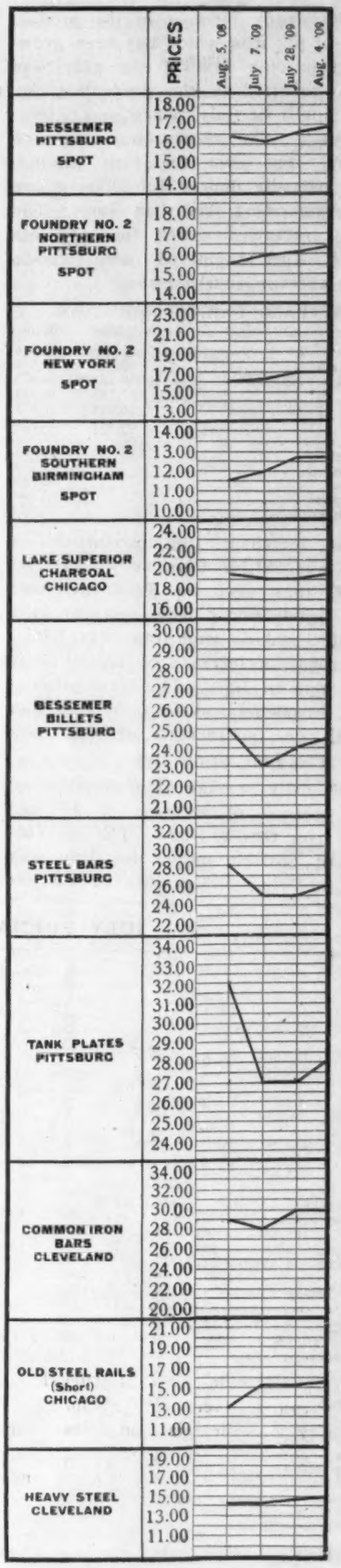
New York, Aug. 4.—The Illinois Steel Co. has sold the Atchison, Topeka & Santa Fe railroad an additional 78,000 tons of open-hearth rails, and the Harriman lines have increased their order 5,000 tons. Inquiry for rails is heavy, and scattering orders booked easily aggregate 5,000 tons.

WILL GRIND FERRO-ALLOYS.

Robert Gilchrist & Co., who have just been incorporated under New Jersey laws, will grind ferro-silicon and ferro-manganese for steel plant and foundry purposes and have established offices at 50 Church street, New York City. The new concern has purchased from the receivers of the Western Foundry Supply Co. the mill formerly operated by that interest at Elizabethport, N. J., which will be enlarged and equipped with new grinding machinery. Ground manganese dioxide will also be manufactured. Robert Gilchrist, president of the new company, is well known to the foundry trade through his long association with the New York office of Rogers, Brown & Co.

"B" stack of the Buffalo Union Furnace Co. was blown in July 22. The Claire stack of Hanna & Co. was lighted July 14.

PRICE CHART.



PASSES TWO-MILLION-TON MARK

The steady increase in the production of pig iron which has been growing since the first of the year was again reflected in the production for the month of July which was 2,088,620 tons. This shows an increase of 158,691 tons over the June production, partially due to July having one more operating day than June. The daily average, however, for July was 67,375 tons, compared with June's daily average of 64,331 tons.

AVERAGE DAILY PRODUCTION.

	1909.	1908.
January	57,654	34,316
February	60,051	37,476
March	58,775	39,672
April	57,788	38,504
May	60,218	37,677
June	64,331	36,876
July	67,375	39,632
August	.....	44,065
September	.....	47,208
October	.....	50,764
November	.....	52,744
December	.....	55,602

The merchant iron production in July was 581,167 tons, an increase of 22,630 tons over the June merchant iron production. The non-merchant or steel-making iron total was 1,487,298 tons, an increase of 132,041 tons over that in June. The total production of spiegel and ferro in July was 20,155 tons, an increase of 4,020 tons over the June production.

The daily average of production for July shows an increase of 4.7 per cent over that of June. The percentage of possible output for July was 60.7, showing an increase of 2.8 per cent over the possibility percentage for June. It was also the highest of the year so far. July also showed a gain in the total number of stacks blowing on the last day of the month, a gain of 19 stacks over the number operating in June. The larger proportion of the stacks blown in during the month just closed are operated by steel companies.

MONTHLY PRODUCTION.

	1909.	1908.	1907.
January	1,787,473	1,043,374	2,194,801
February	1,682,470	1,886,809	2,047,036
March	1,822,024	1,229,856	2,216,709
April	1,731,406	1,155,122	2,226,708
May	1,866,757	1,168,002	2,291,030
June	1,929,929	1,106,300	2,237,420
July	2,088,620	1,228,604	2,253,243
August	.....	1,366,019	2,243,656
September	.....	1,416,252	2,174,148
October	.....	1,573,824	2,359,690
November	.....	1,582,314	1,820,558
December	.....	1,723,664	1,234,733
Total	.....	12,908,679	15,680,140	25,299,732

LAKE ORE SHIPMENTS

For July Aggregate About 6,000,000 Tons—Contract for Another Boat Awarded.

Ore shipments for July are not all in as yet, but they will probably touch the 6,000,000-ton mark notwithstanding the delays caused in the middle of the month by cloudbursts and washouts on the ranges. Duluth alone shipped 2,249,410 tons during July, which is a record for the port. Conneaut, which is the Steel Corporation's ore receiving port on Lake Erie, broke the record for receipts during July, handling 1,250,034 tons. Ore is now moving rapidly and August shipments will be heavy with a probable stiffening in all lines during September. Shippers continue to look forward to a season movement of over 40,000,000 tons.

Coal is beginning to move more freely but not in sufficient quantities to relieve the offerings of tonnage in the ore trade so that there still continues a surplus of vessels. There is some talk of tying up the wild vessels from 10 to 15 days, but this is not likely to be done, though it would strengthen the market materially to do so. Statistics from upper lake ports show a decided falling off in coal receipts in comparison with the corresponding period last year. The coal trade, therefore, must improve as the northwest will need more rather than less coal than it had last year. The indications are for a brisk fall on the lakes and vessel owners are reluctant to charter their ships for the fall grain trade at the rates now offering. They can probably get better terms later on. At present it really looks like an old-time finish with lively bidding for tonnage.

During the week, the American Ship Building Co. closed a contract with the Anchor Line for the construction of a passenger and package freighter to be a duplicate of the Juniata, which was built at Cleveland in 1905. She will be 360 feet over all, 340 feet keel and 45 feet beam, and will have quadruple-expansion engines and Scotch boilers. This makes five vessels for which definite contracts have been placed for 1910 delivery. Other announcements are pending and the ship builders of the lakes are looking forward to a winter of fair activity.

The American Ship Building Co. has placed its common stock upon a 4 per cent basis and W. L. Brown, chairman of the board, has issued a very careful statement giving the reasons therefor. This industrial is one of the most conservatively organized and conservatively managed companies in the United States. Its common stock does not represent a bonus as is customary with many corporations, but $20 per share was actually paid in for it when the company was organized. The dividend of 4 per cent is really 20 per cent of the original value of the stock. The directors have been cautious, however, in putting the stock upon a dividend-paying basis, preferring to carry abundant working capital.

JULY FURNACE REPORT.

STATES.	NO. OF STACKS.	NO. IN BLAST ON LAST DAY OF MONTH. JULY.	JUNE.	PERCENTAGE OF TOTAL POSSIBLE OUTPUT MADE.	AV. DAILY CAPACITY IN BLAST LAST DAY OF MONTH.	MERCHANT.	NON-MERCHANT. ACTUAL TONNAGE MAKE.	TOTALS. JULY.	JUNE.
Pennsylvania	155	110	102	68.7	30,382.0	182,375	720.666	903,041	832,754
Ohio	66	46	43	67.8	15,069.6	115,879	343,515	459,394	424,656
Alabama	46	21	18	41.7	3.691.8	102,088	2,687	104,775	99.355
Virginia	24	11	9	44.6	1,001.0	30,220	———	30,220	28,973
New York	26	18	15	64.7	4,989.6	65,251	84,439	149,690	121,293
New Jersey	9	4	3	35.1	775.6	19,002	———	19,002	18,590
Illinois	25	19	19	79.8	6,974.9	16,312	204,765	221,077	202,697
Tennessee	18	9	8						
West Virginia, Kentucky	4	3	3	39.6	1,736.8	20,308	24,377	44,685	45,046
	7	1	2						
Maryland	4	2	2						
Wisconsin, Colorado, Indiana	6	3	5	62.4	3,849.3	13,388	106,849	120,237	124,412
	6	3	3						
	5	5	5						
Georgia	2	0	0						
Texas	3	0	0						
Minnesota, Michigan, Missouri	1	1	1	34.4	680.8	16,344	———	16,344	16,018
	2	2	1						
	1	1	1						
Spiegel—All states								8,752	6,604
Ferro—All states								11,403	9,531
Total	409	259	240	60.7	69,844.1	581,167	1,487,298	2,088,620	1,929,929

OUR FOREIGN COMMERCE.

FISCAL YEAR TOTALS OF IMPORTS AND EXPORTS.

Gain Each Month This Year in Exports—Historic Gain in Total Value—Imports From 1902

Iron and steel exports in the fiscal year ended June 30 last, slightly exceeded our estimate of a month ago, due to the fact that the June exports ran some 5,000 tons ahead of those in May. The total exports in the fiscal year of scrap, pig iron, rolled iron and steel, wire products, tubular goods, etc., were 1,059,239 gross tons, against 1,161,270 tons in the preceding fiscal year.

The monthly movement has been as follows:

TOTAL IRON AND STEEL EXPORTS, GROSS TONS.

	1907.	1908.	1909.
January	102,630	74,353	70,089
February	64,728	81,773	84,860
March	112,787	96,681	94,522
April	132,792	93,285	100,903
May	91.543	64,020	109,977
June	92,996	69,779	114,721
July	122 249	86,806	.....
August	118,792	87,244	.....
September	114,819	76,727	.....
October	123,170	85,628	.....
November	116,308	71,028	.....
December	86,019	77,656	.....
Total	1,301,979	964,266	575,072

Fiscal Year Totals.

The total iron and steel exports in the fiscal year fell short of the totals in the four preceding years, but easily exceeded the totals for all other years. However, the decline from the banner year, which was 1906, with 1,331,323 tons, was only 20.4 per cent. It may be observed from the table that for three successive years, since 1906, exports have declined, but this does not indicate that the trade is decadent, since the showing is largely the incidence of the calendar. The international demand for iron and steel fell off at the same time as did the domestic demand, October, 1907, being a high month while the next three months showed a sharp decline. The fiscal year 1908, as it included four months, July to October, 1907, of heavy demand, showed a fairly large total, which the fiscal year 1909 was not able to equal, so that a further decline was shown, but there was a noteworthy increase in the later months of this last fiscal year and if the present gait is continued the calendar year 1909 will show a very material increase over the calendar year 1908.

The nature of this movement can be shown by half yearly comparisons, as follows:

1907, first half	597,476
second half	704,503
1908, first half	479,891
second half	484 375
1909, first half	575,072

Thus the second half of 1908 showed a slight gain over the first half, while the first half of the present year showed a great gain over the second half of last year. Thus there has been a progressive gain by half years, and that is not all which indicates an upward trend, since the months of the first half of this year showed a progressive gain, each month doing better than the preceding month by from 5,000 to 10,000 tons.

The net loss in tonnage in the fiscal year 1909 as compared with the preceding fiscal year was about 100,000 tons. This was not uniformly distributed by any means, as some lines showed material gains while other lines showed correspondingly greater losses. The chief gains were in the cruder lines, while the heaviest losses were in more finished products. An exception to this principle is the item of sheets and plates, which showed an increase from 102,531 tons to 137,889 tons. Crude lines which showed gains were scrap, from 20,518 tons to 29,030 tons; crude steel, chiefly billets and sheet bars, 92,893 tons to 109,331 tons, and wire rods, 6,534 tons to 12,715 tons. There were large losses in rails, structural material, wire and wire nails, and pipes and fittings. The last named item showed the heaviest proportionate decrease of the more important finished products, from 168,591 tons to 129,444 tons.

Exports by Values.

A table is given below showing the total value of all iron and steel exports in the past 17 years. The total includes not only the tonnage lines referred to above, but also hardware, cutlery, machinery, etc., with the exception of agricultural machinery.

IRON AND STEEL EXPORTS, FISCAL YEARS.

1893	$ 30,106,482
1894	29,214,393
1895	32,000,989
1896	41,159,422
1897	57,497,872
1898	70,406,885
1899	93,716,031
1900	121,913,548
1901	117,319,320
1902	98.552,562
1903	96,642,467
1904	111,948,586
1905	134,727,921
1906	160,984,985
1907	181,530.871
1908	183,982,182
1909	144,951,357

The most rapid increase in our general iron and steel exports was from 1894 to 1900, the total just quadrupling in six years. That was a period in which American manufacturers were driven to seek the export outlet by reason of comparatively poor trade at home. The exports of the regular iron and steel lines were encouraged by the fact that the domestic prices were also low, while the exports of machinery, hardware, etc., were aided by the fact that the domestic manufacturers could obtain their raw materials at low prices, not much, if any, above those which their foreign competitors had to pay.

Imports.

The import movement in iron and steel is small, the total of scrap, pig iron and finished rolled iron and steel including tin plates, being only 212,077 gross tons in the last fiscal year. Our imports have been large only when there was a scarcity of material in the United States, this applying in particular to pig iron. The normal import movement in pig iron is confined almost altogether to the manganese metals, ferro-manganese and spiegeleisen.

Our total iron and steel imports have fluctuated as follows in the past eight years:

Fiscal Year.	Gross tons.
1902	458,851
1903	1,723,251
1904	502,914
1905	287,753
1906	491,942
1907	746,675
1908	354,574
1909	212,077

The movement in 1902-3 is well remembered. Of the total of 1,723,251 tons shown above, 135,901 tons was scrap, 956,198 tons pig iron, 379,476 tons billets, sheet bars, etc., and 122,994 tons rails, these four items constituting 1,594,519 tons and leaving only 128,732 tons for all other items.

IRON AND STEEL EXPORTS, GROSS TONS.

	June,		Twelve months ending June,	
	1908.	1909.	1908.	1909.
Scrap	1,991	7,837	20,518	29,030
Pig iron	4,906	7,846	52,518	50,178
Billets, sheet bars, etc.	5,583	10,574	92,893	109,331
Wire rods	462	1,519	6,534	12,715
Rails	15,759	20,813	278 867	234,128
Structural iron and steel	8,417	8,999	134.299	101,653
Bar iron	622	1,089	13 065	11,625
Steel bars	3,022	7,205	63,128	52,667
Sheets and plates	7,005	16,102	102,531	137,889
Tin plates	113	630	15,010	5,094
Hoop, band and scroll	274	235	8,560	3,448
Wire	10,416	16,745	156,960	140,569
Wire nails and spikes	1,234	2,434	35,541	26,784
Cut nails and spikes	528	979	6,481	8,014
All other, including tacks	491	583	5,774	6,670
Pipes and fittings	8,956	11,131	168,591	129,444
Totals	69,779	114,721	1,161,270	1,059,239

IRON AND STEEL IMPORTS, GROSS TONS.

	June.		Twelve months ending June.	
	1908.	1909.	1908.	1909.
Scrap	537	50	17,614	5,182
Pig iron	9,341	10,623	204,092	104,655
Billets, bars and steel n. e. s.	1,099	1,103	16,499	12,627
Wire rods	1,110	838	13.570	11,358
Rails	206	.....	2.839	1,292
Structural	61	91	1.530	5,475
Bar iron	859	818	32.504	14.869
Sheets and plates.	241	189	2 623	3.167
Tin plates	7,650	5,647	62,830	52,372
Hoop, band and scroll	2	46	473	1,080
Totals	21,106	19,405	354,574	212,077

METAL SCHEDULE.

(Continued from page 223.)

the rates of the Dingley tariff include anchors, anvils, cotton ties, railway bars, steel rails and fish plates. The cut in the rate on anchors is from 1½ to 1 cent per pound; on cotton ties, from five-tenths to three-tenths of a cent per pound; on iron and steel rails, from seven-twentieths of a cent per pound to seven-fortieths; on fish plates, from four-tenths of a cent per pound to three-tenths.

Foreign Competition.

In the opinion of senators and representatives who have studied the subjects of iron ore and coal, and the probable influence of suggested changes in duties, the impression prevails that the rates on both these articles will tend to invite foreign competition which may be disastrous to the domestic industry. Senator Dick, of Ohio, expresses the opinion that with the rate of 15 cents a ton on iron ore, and the attendant reciprocity concessions under the treaty with Cuba amounting to 20 per cent, large importations of iron ore from Cuba may be expected under the new rate. He also believes that ore from Mexico and Spain will be imported under the new rate.

In line with the predictions that have been made with respect to the general features of the new tariff, the increases made by the senate bill, not only above the rates of the house bill as it was originally passed, but in some instances above the rates of the Dingley tariff on highly finished products, have been carried into the new measure. Illustrations of these new rates are found in the provisions of the metal schedule covering "high speed steel," the ferro-alloys, certain kinds of finished structural steel, and some of the finished cutlery and razors.

Corporation Tax.

Substantially all of the provisions incorporated by the senate with respect to the drawback law, the maximum tariff, and the corporation tax, are carried into the new measure. The most important change made by the conference in the corporation tax is the elimination of the application of the tax to corporations known as "holding companies." Presiden Taft resisted the application of the tax to holding companies, upon the ground that such corporations simply hold the stocks of the original corporations, and an assessment of a tax upon the holding corporations would amount to double taxation. The rate is carried into the corporation tax provision at 1 per cent, and the inquisitorial features of this system as applicable to corporations which make improper returns or no returns are permitted to stand.

Drawback.

The drawback provision of the new measure is somewhat more liberal than that of the Dingley law, but by no means so liberal as was this provision of the Payne bill as originally prepared. The substitution of domestic materials for imported materials has been entirely eliminated, but the retention of waste materials or by-products of articles manufactured from imported materials upon the payment of duty upon such waste or by-products is authorized by the new drawback section.

It is understood that the liberality shown by the conference report in reducing the cost of materials for manufactures, notably iron ore, coal, hides and lumber, operated to prevent more liberal concessions in the matter of the payment of drawback on such imported materials entering into commodities destined for export.

Changes Made by the Conference.

A comparison of the duties on the items in the metal schedules of the Dingley law and the house and senate bills was published in THE IRON TRADE REVIEW, July 15, 1909, and as the senate bill rates for the metal schedule were substantially agreed upon, only those changes made by the conference committees are noted in the accompanying table:

Article.	Conference Report.	Dingley Law Duty.	Senate Bill.
Iron ore	15c. per ton	40c. per ton	25c. per ton
Scrap iron	$1 per ton	$4 per ton	$2.50 per ton
Scrap steel	$1 per ton	$4 per ton	$2.50 per ton
Tungsten ore, chrome metal, tungsten, etc.	10% ad valorem	.....	.....
Ferro-silicon, containing not over 15 per cent silicon	15% ad valorem	$4 per ton	$4 per ton
Beams, girders, joists, etc., and all other structural shapes of iron or steel	3/10c. & 4/10c per lb.	5/10c. per lb.	4/10c. per lb.
Structural steel when fitted for use.	45% ad valorem	.....	.....
Nails, wire, made of wrought iron or steel—			
Not less than 1 inch in length and not lighter than No. 16 wire gage	4/10c. per lb.	½c. per lb.	½c. per lb.
Less than 1 inch in length and lighter than No. 16 wire gage.	¾c. per lb.	1c. per lb.	½c. per lb.
Anchors	1c. per lb.	1½c. per lb.	.....

Important Features of New Tariff Administrative Sections.

The provisions of the dutiable schedules and free list shall constitute the minimum tariff and after March 31, 1910, in addition to the regular rates there shall automatically attach itself, a duty of 25 per centum ad valorem on all merchandise imported into the United States and possessions except Philippine Islands.

If the president is satisfied on and after the above date any country or any dependency imposes no discriminating terms or restrictions on American exports, he may proclaim the minimum rates. The president's proclamation may affect any political sub-division of any country. The president is authorized to employ such persons as are necessary to discharge the duties imposed upon him herein. The reciprocal agreement with Cuba, made in 1902, remains in full force and effect.

Ten days' notice after passage of the Payne tariff bill shall be given by the president to all foreign countries of the termination of all commercial and reciprocal agreements made under the Dingley act, but wherein the agreements no stipulation was made for the termination of the same, then the time shall be six months from April 30, 1909.

Marking and Labeling.

All articles of foreign manufacture shall be marked or labelled the name of the country of origin and the quantity of contents, if same can be done without injury. Any person fraudulently violating the laws as to marking shall be liable upon conviction to a fine of $5,000 and imprisonment for one year.

Bonded Smelting Warehouses.

Upon giving satisfactory bonds, the mills of manufacturers engaged in refining or smelting may be designated as bonded smelting warehouses and the imported ores or crude metals may be removed directly from the vessel and melted in connection with other ore. The secretary of the treasury may make regulations concerning the same.

As in the Dingley act, there shall be a drawback or rebate of all duties, except 1 per centum, paid by the importers to the government on the exportation of articles manufactured in the United States wholly or partly from foreign materials. Any drawback allowed under the existing law shall be continued at the same rate. Where they are of domestic and foreign materials, in order to get the benefit of the drawback, the quantities of imported material therein must be clearly proved.

Invoice Regulations.

There shall be four kinds of declarations, either to go with entries of im-

ported merchandise: (1) That of the importer or agent where merchandise has been actually purchased; (2) that of importer or agent where the goods have not been actually purchased; (3) that of owner where merchandise was actually purchased; (4) that of manufacturer where not actually purchased.

Two very important and just provisions are contained in paragraph 7. One allows on all invoices a deduction from the value as well as an addition to the value, expressed thereon, in order to meet the fluctuations in the market. Under the present law, duty could be taken in no case on less than the invoice value and additions to make market value were restricted to where the merchandise was actually purchased. But now the situation is more equitable. The other is that the penalty of 1 per centum for every 1 per centum of advance over the entered value shall not accrue, unless appraised value be an advance of over 5 per centum. Under the Dingley law, all penalty had to be paid and under the McKinley act the penalty began at an advance of 10 per centum, but the rate of penalty was then 2 per centum for every 1 per centum of advance.

Under paragraph 11, the appraising officer, if he cannot satisfactorily ascertain the foreign market value, may take the cost of production at the time of exportation to the United States, estimating all general expenses at not less than 8 per centum nor more than 50 per centum and add them to cost of production.

Where there is no foreign market value for merchandise, and where goods are not freely offered for sale and actually sold, to all purchasers, the appraised value shall be the wholesale market value in the open markets of the United States, due allowance by deduction being made for estimated duties thereon, cost of transportation, insurance and other necessary expenses from the place of shipment to that of delivery and a commission, not exceeding 6 per centum, if any has been paid, or contracted for, on consigned goods, or an allowance for general expenses not exceeding 8 per centum.

Appeals for Re-Appraisement.

Paragraph 13 allows appeals to the general appraisers for re-appraisement on imported merchandise, as follows: To the collectors of customs 60 days, and to the importers 10 days from the date of entry for re-appraisement by a single general appraiser. If either or both are dissatisfied, the collector may, within 10 and the importers within five days from date of single general appraiser's decision, appeal to a board of three general appraisers. Under the present law the importers have two days in each instance and the collector is not limited to time.

Customs Court of Appeals.

Paragraph 29 of section 28 creates a United States customs court of appeals consisting of a presiding judge and four assistant judges at a salary of $10,000 each per annum. There shall be appointed by the president an assistant attorney general and a deputy assistant attorney general and four attorneys to represent the government. Clerks and stenographers shall be appointed at various salaries.

Decisions of the board of general appraisers shall be subject to review by this court only, and where it has jurisdiction and writs of *certiorari* are allowed, the United States supreme court may pass upon the decisions of this appellate court. In case of vacancy of said judgeships the president of the United States may appoint district judges who shall qualify.

Operation of New Law.

On and after the day of passage of this act (Payne tariff) the duty on imported merchandise, where no entry has been previously made or where entered without payment of duty under bond for warehousing, for which no permit of delivery to importers has been issued, shall be subject to this act.

Corporation Tax.

That every corporation, joint stock company or association, organized for profit, having a capital stock represented by shares, engaged in business in any state or territory of the United States, including Alaska and District of Columbia, shall be subject to pay annually a special excise tax of 1 per centum upon the net income over and above $5,000 received by it during the year, exclusive of amounts received as dividends on the stock of other corporations owned by it.

The net income shall be ascertained by deducting from the gross income: (1) All ordinary and necessary expenses actually paid, including charges for rentals and franchises; (2) all losses actually sustained during the year not compensated by insurance, including a reasonable allowance for depreciation of property; (3) interest actually paid on its bonded or other indebtedness to the amount of such indebtedness not exceeding paid-up capital stock; (4) all sums paid for taxes; (5) all amounts received as dividends. There shall be a further deduction of $5,000 and upon the remainder the said tax shall be computed. Said tax shall be levied for the year ending Dec. 31, 1909, and every year thereafter.

On or before March 31, 1910, an accurate return, under oath by the corporation's principal officer, shall be made to the collector of internal revenue for the district in which such corporation has its principal place of business or, in the case of foreign corporations, the principal place of business in the United States.

Annual Statement.

The statement shall set forth: (1) The total amount of paid-up stock outstanding at the end of the year; (2) total amount of indebtedness; (3) gross amount of income; (4) total amount of ordinary and necessary expenses; (5) total amount of losses sustained during the year; (6) total amount of interest actually paid; (7) the amount of taxes paid by it within the year; (8) the net income of such corporations after making the deductions in this section authorized. All such returns or statements shall be transmitted by the collector to the commissioner of internal revenue.

If any return or statement is made with false or fraudulent intent, the commissioner shall add 100 per centum of such tax, and, in case of refusal or neglect to make a return, he shall add 50 per centum of such tax. The commissioner shall have power to examine any books and paper of such corporation, and to examine under oath such person or persons as are connected therewith.

Thirty days additional shall be allowed in which to make the return to the collector, in case of the absence or sickness of the principal officers of such corporation.

All assessments shall be made and the several corporations shall be notified of the amount for which they are liable on or before the first day of June, each year, and the said assessments shall be paid on or before the 30th day of June ensuing, except in cases of neglect and in cases of fraudulent return. The commissioner, upon discovery of such cases, at any time within three years after said return is due, may make a return upon information as hereinbefore provided for.

For ten days after the 30th day of June, there shall be added the sum of 5 per centum on the amount of tax unpaid, and interest at the rate of 1 per centum per month upon said tax from the time same became due.

Penalties.

If any corporation shall refuse or neglect to make a return, at the time

hereinbefore specified each year, or shall render a false or fraudulent return, such corporation shall be liable to a penalty not less than $1,000 nor more than $10,000. Any person who makes a fraudulent return or statement with intent to evade the assessment shall be guilty of a misdemeanor and shall be fined, upon conviction, not exceeding $1,000, and shall be imprisoned for not more than one year.

Section 42 provides that the Payne tariff shall take effect on the day following its passage.

OBITUARY.

Calvin Wells died at his home in Pittsburg on August 2, aged 81 years. Mr. Wells attended to business duties at his office upon the day of his death, and his immediate family was not present when the final attack overtook him at his home.

Calvin Wells was born in Genesee county, New York, Dec. 26, 1827. His family was quite prominent, and his maternal grandfather, Rev. Samuel Taggart, a Presbyterian minister, at one time represented the western district of Massachusetts in congress. His father subsequently settled in western New York. Mr. Wells began his active business life at the age of 15, when he entered the store of his brother-in-law, P. S. Church, a Detroit merchant. Two years later he returned to Batavia, N. Y., where the desire for a better education led him to write to his brother in Pittsburg, a Presbyterian clergyman. The result was an invitation to make his home in Pittsburg, and he took up his residence there in 1847 entering the old Western university. His education completed, he became interested in business affairs and came in contact with Dr. C. G. Hussey, who was operating a copper mill. After several business ventures the firm became Hussey, Wells & Co., and engaged in the manufacture of steel. Mr. Wells was appointed manager.

He disposed of his interest in 1876. In 1865 Mr. Wells became interested in railway elliptic springs and was a partner in the firm of A. French & Co., then engaged in their manufacture. On leaving the firm of Hussey, Wells & Co., Mr. Wells gave his attention for several years to the spring company. In January, 1878, he was chosen president and treasurer of the Pittsburg Forge & Iron Co. and held these positions at the time of his death. In 1884 he sold his interest in the firm of A. French & Co.

Mr. Wells became interested in the newspaper business in 1877, when he joined in the purchase of the Philadelphia *Press*. Among his other interests Mr. Wells was engaged in the production of spelter. He was instrumental in the organization of the Illinois Zinc Co., Peru, La Salle county, Ill., and had been president and treasurer of the company since its formation. He was also a director in other enterprises. Mr. Wells is survived by three children, one son and two daughters. The son, Benjamin Wells, is president of the Philadelphia *Press*.

Capt. Lord Mortimer Coe, president and founder of the Cleveland City Forge & Iron Co., director of the Lehigh Valley Railroad Co. and prominent in the banking affairs of Cleveland, died at his home in that city, Aug. 2. He was born in Pen Yan, N. Y., Nov. 14, 1828, and entered active life as an engineer on one of the earliest lake steamers. Subsequently he became interested in a large fleet of lake boats, but in 1863 he sold his vessel interests and the next year founded the Cleveland City Forge & Iron Co. A widow and a son, Ralph M. Coe, survive him.

Louis Philip Ewald, president of the Ewald Iron Co., St. Louis, who died in Louisville, Ky., Saturday, July 31, was buried in Bellefontaine Cemetery, St. Louis, Tuesday, August 3. Mr. Ewald was 63 years of age and had been an invalid for two years. He was a native of St. Louis, but went to Lyon County, Ky., when he was a young man, and there became interested in the iron business. He bought the Coleman Bros.' Iron Mills in Louisville, in 1886.

STRUCTURAL ORDERS.

(Special Telegram.)

New York, Aug. 4.—The sale of the Passaic steel plant has been postponed to Nov. 12, pending the hearing of an appeal against the setting aside of the former sale. Bethlehem steel sections will be used in the following local building contracts: Coleman building, 2,000 tons; Beckstein warehouse, 900 tons; Park avenue apartment, 1,000 tons, and four smaller projects aggregating 1,000 tons.

The Carnegie Steel Co. is now blowing 51 blast furnace stacks out of a total of 59. The last of the Carrie stacks was lighted July 16; of the Isabella, July 26, the Sharon, Pa., stack, July 13, and the second Bellaire stack, July 10.

Stack "A" of the Woodstock Iron & Steel Corporation at Anniston, Ala., was blown in July 7.

STEEL PLANT

Will be Built by the Standard Steel Car Co.

Complete plans have been prepared, and some contracts have already been awarded, for the erection of a new steel works near Butler, Pa., by the Forged Steel Wheel Co., a subsidiary company of the Standard Steel Car Co., Pittsburg. An extensive tract of land, immediately adjoining the plant of the wheel company, has been acquired and will be utilized as the site for the new works.

The new steel plant will consist of six open-hearth furnaces of about 60 tons capacity each and a slabbing mill. The steel in the form of slabs will be used exclusively by the Forged Steel Wheel Co., whose plant, when operating double-turn, has a capacity of from 800 to 1,000 steel wheels daily.

The McClintic-Marshall Construction Co., Pittsburg, will erect the buildings for the new works which will require about 6,000 tons of structural material. Mackintosh, Hemphill & Co., Pittsburg, have been given the contract for a 55 x 60-inch reversing engine which will develop about 7,500 horsepower. The contract for the slabbing mill has not yet been placed.

The Standard Steel Car Co. at the present time is a large buyer of steel plates, shapes, bars and slabs for its car and wheel works operations. This material is furnished largely by the Carnegie Steel Co. and the Illinois Steel Co., as the company has plants at both Butler, Pa., and Hammond, Ind.

The Oriskany Ore & Iron Co. lighted its Allegheny, Va., furnace, July 9. This is the second furnace of the company blowing.

PIG IRON PRODUCTION.

(Continued from first page.)

Other purchases include 3,000 cars for the Chicago, Burlington & Quincy, and 2,400 for the New York Central. The Santa Fe has purchased 7,800 tons of open-hearth rails, and the Harriman lines have taken an additional 5,000 tons. The Chicago, Burlington & Quincy is inquiring for 20,000 tons for delivery the remainder of the year. Bids on rails for export have been received from the Manila railroad, for 10,000 tons, and 900 tons of girder rails for Japan. Light rails have been advanced $1. An order for plates for another lake boat, amounting to 2,000 tons, has been placed.

Industrial Stocks Advanced

The dividend increase for the United States Steel Corporation, and the agreement of the conference committee on the tariff, had the effect of strengthening prices of stocks, throughout the whole list during the past week. The United States Steel, Southern Pacific and other stocks made new high records, and the whole tendency of the market was buoyant.

Monday was one of the dullest days of the month with prices averaging slightly lower with declines in Amalgamated Copper and United States Steel. Tuesday, the directors of the United States Steel Corporation made announcement of an advance in the dividend rate, thereby stimulating the market and starting a general upward turn. Republic Iron & Steel directors announced that they would sell the remaining unissued preferred stock, amounting to over $4,000,000. Wednesday, Union Pacific, New York Central and B. & O. issues were conspicuous for their upward tendency, while Amalgamated Copper was weak on the further reductions in prices. The grain market rallied somewhat. Thursday, the New York stock market continued firm with prices advancing. The agreement on the tariff bill was reached by the conference committee Friday. Union Pacific reached the highest point in its history, and the activity of stocks was greater than at any other time in the week. This activity was largely the result of the tariff agreement. On Saturday, the market continued buoyant, with speculation broader than the day before.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo- July 31	Changes in week	Date 1909 Ann.	M't'g.	Stock Outstanding	Dividend Basis	Last Declared	Date Last Div. Pay.
Allis-Chalmers	15¾	+ ¾	Sept.	2	$19,820,000			
Allis-Chalmers, pr	55	+2¼			16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	12½	+⅜	Feb.	2	41,233,300			
American Can, pr	83½	+ ¾			41,233,300	7 cum	1¼ Q.	July, 1909
Am. Car & Foundry	66¼	+3½	June	24	30,000,000		½ Q.	July, 1909
Am. Car & Fdy., pr	120	+1			30,000,000	7 n. c.	1¾ Q.	July, 1909
American Loc	65⅛	+2⅝	Oct.	19	25,000,000	5	1¼ Q.	Aug., 1909
American Loc, pr	120	— ¼			25,000,000	7 cum	1¾ Q.	July, 1909
American Ship	66¾	+8¼	Oct.	13	7,600,000	4	1 Q.	Sept., 1909
American Ship, pr	107	.....			7,900,000	7 cum	1¾ Q.	Oct., 1908
Am. Steel Foundries(new)	55¼	+¼	Dec.	2	17,184,000			
Barney & Smith	35	+5	June	1	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith, pr	85	—10			2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	31½	+1½	April	6	14,862,000			
Bethlehem Steel, pr	62	+1¾			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	43⅛	+ ⅛	March	16	45,000,000*	3	1½ S. A.	Feb., 1909
Cambria Iron	45½	+ ¼			8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool	23	—2	Feb.	15	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	47⅝	+3¼	Oct.	18	34,235,500		3½	April, 1902
Crucible Steel	13½	+1¾	Oct.	20	24,578,400			
Crucible Steel, pr	81½	+6⅜			24,436,000	7 cum	1 Q.	Mar., 1909
Empire Steel	10	.....	April	27	1,254,770			
Empire Steel, pr	65	+5			2,500,000	6 cum	3 S. A.	July, 1909
Fay & Egan	90	.....	Feb.	18	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	125	.....			1,000,000	7 cum	1½ Q.	May, 1909
General Electric	170	+3	May	11	65,178,800	8	2 Q.	July, 1909
Harbison-Walker	20½	.....	Jan.	18	18,000,000		½	Oct., 1907
Harbison-Walker, pr	.....	.....			9,600,000	6 cum	1½ Q.	April, 1909
International Pump	39¾	— ¼	June	8	17,762,500		1	April, 1905
International Pump, pr	87	—1			11,350,000	6 cum	1½ Q.	Aug., 1909
Lackawanna Steel	48	.....	March	10	34,971,400		.....	.....
Lake Sup. Corp	26½	+2¼	Oct.	6	40,000,000		.....	.....
New York Air Brake	91½	+2½	June	17	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	100	.....	Feb.	3	8,500,000	3	1½ Q.	June, 1909
Niles-Bement-Pond, pr	100	.....			2,000,000	6 cum	1½ Q.	May, 1909
Otis Elevator Co	59	.....	March	15	6,375,300		1½ S. A.	April, 1909
Otis Elevator Co., pr	99	.....			6,295,000	3 n. c.	1½ Q.	July, 1909
Penn Steel	68	.....	May	10	10,750,000		.....	.....
Penn Steel, pr	116	— ½			16,500,000	7 n. c.	3½ S. A.	May, 1909
Pittsburg Coal Co	13⅜	— ⅜	March	9	28,104,600		.....	Nov., 1906
Pittsburg Coal Co., pr	51	— ⅜			27,071,800	7 c.	1¾	April, 1905
Pressed Steel Car	48⅜	+2¼	Feb.	17	12,500,000		3	Aug., 1904
Pressed Steel Car, pr	107	+1			12,500,000	7 n. c.	1¾ Q.	Aug., 1909
Pullman	189	—1	Nov.	10	100,000,000	8	2 Q.	Aug., 1909
Railway Stl. Spring	48½	+2	March	4	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring pr	106	.....			13,500,000	7 cum	1¾ Q.	July, 1909
Rep. Iron & Steel	37½	+3¾	Oct.	20	27,191,000		.....	.....
Rep. Iron & Steel, pr	106¼	—2¾			20,416,900	7 cum	2 Q.†	Aug., 1909
Sloss-Sheffield	85¾	+2¾	March	10	10,000,000	5	1¼ Q.	June, 1909
Sloss-Sheffield, pr	117	+ ½			6,700,000	7 n. c.	1¾ Q.	July, 1909
U. S. Pipe & Fdy	32⅝	+1⅜	June	23	12,500,000	2	½ Q.	Dec., 1907
U. S. Pipe & Fdy. pr	84	+ ½			12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	74	+2⅞	April	19	508,302,500	3 n. c.	¾ Q.	Sept., 1909
U. S. Steel, pr	128⅛	+1⅛			360,281,100	7 cum	1¾ Q.	Aug., 1909
U. S. Steel, 5s	106	.....			463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	66¾	.....	Sept.	21	9,073,680		.....	.....
Westinghouse Elec	85¾	+1⅛	June	16	27,173,200	10	2½ Q.	April, 1909
Westinghouse Air Brake	118	+1½	Oct.	5	14,000,000*		2½ Q.	Oct., 1907

Par value of shares, $100, except those starred (*), $50.
†¼ ex. and 6¾ to apply on deferred dividends.

Money on call varied from 2 to 1½ during the week, time money was firmer, but borrowers in many cases declined to follow the market up. Exports of gold from New York for the week were $910,300, of which $900,000 was shipped to Argentina. Imports of gold were $65,688. Bank clearings for the United States fell off, being the smallest since last March, with the single exception of the holiday week in the early part of last month. The estimated clearings of the week were $2,753,291,875, which is 8 per cent less than the week before. The actual report of clearing house banks showed loans increased $2,390,400; deposits increased $846,600; surplus decreased, $1,485,475, and the ratio of reserve 27.2 per cent. Commercial failures for the week were 227, compared with 264 last week, and 275 the corresponding week last year. The number of shares sold on the New York Exchange was 3,659,299, as compared with 3,478,974 the week before, and 3,354,940 a year ago.

Copper Stocks.

New York.—Amalgamated Copper closed 84⅞, a net gain of ⅞.

Boston.—Butte Coalition closed 26, a loss of ⅛; Calumet & Arizona closed 106½, a gain of ¾; Calumet & Hecla closed 665, a net gain of 15; Quincy Mining closed unchanged at 90; North Butte Mining closed 58¾, a net gain of 1¼.

Financial Notes.

The International Steam Pump Co. is preparing to issue twenty-year, five per cent, first mortgage bonds to the amount of $12,000,000. So much as is necessary of the proceeds will be used to retire $3,500,000, six per cent debentures now outstanding, redeemable at 105, to pay $1,500,000 of floating indebtedness, and for improvements, new machinery and other corporate purposes. A meeting of the stockholders of the Henry R. Worthington Co. has been called to authorize an issue of twenty-year, five per cent debentures to fund the indebtedness of the Worthington company to the International Steam Pump Co.

The American Shipbuilding Co. has declared a dividend on its common stock of 4 per cent, to be paid in 1 per cent quarterly installments.

The Pittsburg Coal Co. reports for the six months ending June 30 that its gross earnings were $964,684, an increase of $96,615.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January	5,506
February	5,346
March	5,396
April	5,508
May	5,533
June	5,551
July	5,572

August 5, 1909.

PIG IRON BASIS FOR SCALE CONTRACTS.

The great increase in the tonnage of basic pig iron passing through the market leads this commodity more often than formerly to be employed as the basis for adjustment in sliding scale contracts. In 1896 the production of basic pig iron was only 336,403 tons, less than one-thirteenth of the Bessemer pig iron production and less than 4 per cent of the total production of pig iron. In 1900 basic pig production passed the million-ton mark, being more than one-eighth the Bessemer pig iron output, while in 1907 it amounted to 5,375,219 tons, two-fifths the Bessemer output and more than one-fifth the total output.

The increase in proportionate production does not tell the whole story of the rise in value of basic pig iron as a basing standing for scale contracts. In the early years, basic pig iron was made chiefly in the south and by a few northern steel interests. No definite market price existed for the northern iron and the northern industry would not care to base its operations on a southern commodity as the necessary relation to other values could not be supposed to exist. It is only within comparatively a few years that a large tonnage of basic iron has been made and sold by merchant furnaces in the valleys, furnishing a definite market price. It is practically essential in a price standard that the commodity involved shall be so sold that there can be no questions raised as to the validity of transactions. It would be inconvenient, if not impossible, to include pig iron sales, made in different districts, in formulating a standard price. Long ago, Bessemer pig iron, being made for merchant purposes scarcely anywhere but in the Mahoning and Shenango valleys, became a very convenient standard for scale contracts. There was always a recognized market price, well known throughout the trade, and as the great bulk of the steel produced was by the Bessemer process, Bessemer pig iron was recognized as the only pig iron standard desirable. In late years the growth of basic steel making has been so rapid that the tonnages of basic and Bessemer steel are substantially identical, with basic promising soon to lead Bessemer by a large margin. The growth of basic steel-making, moreover, has run largely to relatively small detached operations, for which the pig iron is purchased, so that, despite the fact that Bessemer pig iron is used also in acid open-hearth steel manufacture, the tonnage of basic pig iron passing through the open market greatly exceeds the similar tonnage of Bessemer. It is true, basic pig iron is made in more districts than Bessemer, but in the valleys alone the merchant tonnage of basic exceeds the merchant tonnage of Bessemer.

Scale contracts, based on pig iron, are perhaps not as common in finished steel products as they once were, but they are more common than formerly in the cruder materials, and promise to become a feature of the coke trade, which until recently has not used sliding contracts at all except those involving the exchange of so many tons of coke for one ton of pig iron of one grade or another. The coke contract based directly upon the market price of pig iron, with the relation varying according to a plan mutually agreed upon, has gained in favor over the exchange arrangement. Even ore has, upon occasion, been sold on the basis of pig iron.

When a pig iron basis is desired, the question has been much canvassed whether basic or Bessemer is the better basis. There has been much hair splitting by buyer or seller as to whether a basic or a Bessemer basis offers the greatest prospect of gain. The probable spread in the future between the two grades is an ever fruitful subject for discussion. There has been the prospect for several years that the spread would increase, but it has not done so, having been not over 50 cents in the past few weeks. Because Bessemer ores sell at from 75 to 80 cents more than non-Bessemer in the open market is cited as reason why the spread should be larger, but when the difference in iron content is considered and the difference in coke consumption taken into account, much of the spread apparently dictated disappears and the spread is not likely to increase greatly unless there should arise a greater spread in the market values of the ores.

SCARCITY OF STEEL DRAFTSMEN.

One of the leading structural steel interests calls our atention to the current scarcity of skilled draftsmen in this line as an indication that the early future may be expected to bring out construction projects involving an extremely heavy tonnage of steel. It is a well known fact that during depression periods in the steel trade many capable draftsmen who are thrown temporarily out of employment find new connections in other directions and never return to their original profession. This number, however, is small in proportion to the number of draftsmen normally employed and can not explain the present scarcity, which is noted in the west

as well as in the east and is a source of complaint not only with architects and structural steel engineers, but with a variety of allied interests and particularly with the railroads. The inference to be drawn from this "dearth of draftsman" is most encouraging at this time, inasmuch as the volume of building and bridge propositions before the structural steel trade, doubtless because of the usual mid-summer dullness, has recently been materially reduced.

SHEET AND TIN PLATE LABOR CONDITIONS.

Sheet and tin plate mill operations of the independent companies are a factor of increased importance in the sheet and tin plate market at the present time, by reason of the strike in progress between the American Sheet & Tin Plate Co. and the Amalgamated Association of Iron, Steel and Tin Workers, which has considerably curtailed the output of the principal producer. Practically all the independent sheet and tin plate interests have signed the scale and are not involved in the labor controversy. The one exception is the Youngstown Sheet & Tube Co.

Sheet production has not been especially affected by the present strike since only a few of the mills of the American Sheet & Tin Plate Co. have been unionized. The operations of the leading interest are now about 75 per cent, or practically at the point at which they were interrupted when the strike order of the Amalgamated association became effective. The total sheet capacity of the company consists of 186 hot mills, or slightly less than half of the serviceable mills of the country. Included in this total, however, are some plants which are not operated even in periods of activity. The independents of the country control 32 sheet plants which may be regarded as being in the active class, and these have a total of 192 hot mills. Of the hot-rolling equipment, about 175 mills, or 91 per cent, are now in operation. The galvanizing departments of the independents are running at about 93 per cent of total capacity. Under the conditions it is not probable that any considerable falling off in sheet production will result even in the event of a prolonged strike.

In tin plate the situation presents possibilities of more serious results. The American Sheet & Tin Plate Co. occupies a more commanding position in this industry than in that of sheets. It controls a total of 242 hot mills, of which 213 mills are considered as serviceable capacity. The 16 active independent plants in the country have a total of 100 hot mills.

According to the official announcement of the leading producer, it is now running, in the face of the strike, 113 mills, or 47 per cent of total capacity, which is equivalent to 54 per cent of its working equipment. At the time of the strike, the company was operating 202 hot mills or 83 per cent of its total capacity. The independent companies having signed the scale are running steadily, and 92 mills, or 92 per cent are making tin plate.

During the months of July and August, demands upon the mills by tin plate users are customarily the lightest of the year, as the canning trade, the source of greatest consumption, is then engaged in making finished stock for the fruit and vegetable crops and usually has entered its orders at a previous date. From the standpoint of the mills, the mid-summer months are the most favorable time of the year for any labor disturbance because of the smaller tonnage moving to buyers. In the fall, however, the mills begin preparations to supply the needs of the fish packing industry, and pile stock until about Jan. 1, when shipments to this trade are commenced. In 1908 the total tin and terne plate output of the United States was 537,087 gross tons, the second largest production in the history of this industry. In 1906 the mills produced 577,562 gross tons.

INDEX TO VOLUME XLIV.

The index to Volume XLIV of THE IRON TRADE REVIEW, covering the issues for the first half of 1909, is now ready, and will be mailed to all subscribers who wish to receive it.

It is reported that the Sheffield Castings & Mfg. Co., Sheffield, Ala., will locate a factory in Seattle for the manufacture of pipe and plumbers' supplies.

NEWS OF THE IRON MINES.

Novel Mining Operations—Discoveries of Extensive Ore Deposits.

Ishpeming, Mich., Aug. 2—Still another idle mine is being restored to the active list in the Lake Superior iron region. This is the Buffalo & Susquehanna Co.'s Munro property, near Quinnesec, Menominee range. The mine has not been producing since last year. The past fortnight has been devoted to overhauling the machinery and unwatering the workings. The Munro is an open pit property. The ore is not of especially good grade, but it is cheaply mined and is desirable for use as a furnace admixture.

Operations, unusual to the old mining districts of the Lake Superior region, are in progress at the Buffalo & Susquehanna Co.'s Portland mine, near Michigamme, at the western end of the Marquette range. The ore generally lies at very considerable depth in these old fields, but the conditions are such in this particular case that it is possible to apply mining methods common to the Mesabi range, with its great flat beds. The ore at the Portland is being taken out by the use of the steam shovel. The work is being done by Hoose & Person, a contracting firm of Iron Mountain. The ore is a brown hematite, and although much harder than the Mesabi product, it is readily mined by steam shovel, and this without necessity of blasting. The contract calls for the removal of 130,000 tons of ore this season. A portion of the overburden has been stripped, and mining has been in progress the past two weeks.

Power Plants.

Contrary to the general understanding, it is not the intention of the Cleveland-Cliffs Iron Co. to immediately proceed with the development of its proposed waterpower plant on the Carp river, Marquette range. The work now contemplated is the installation of two electric transmission plants, one at the Maas mine at Negaunee, and the other at the central power station in the Swanzey district, 20 miles south of Negaunee. The officials have given the waterpower project much consideration, and surveys have been made, but it is stated now that the improvement will not be undertaken for a year or perhaps two years or longer. It is hardly likely that the cost will fall under $1,000,000. The two transmission plants will be operated by steam power at the start. Their installation will be pushed to as early a completion as pos-

sible. The plants will be duplicates. Two 1,500-kilowatt steam turbines and generators will be installed. The turbines are of the Allis-Chalmers make, and the motor equipment has been ordered from the Westinghouse company.

New Ore Properties.

The Cleveland-Cliffs company has added another property in the Iron river district of the Menominee range. This is the Erickson tract, in Section 20, 34-43. Diamond drilling is under way. Exploration has been very active in the Iron river and Stambaugh fields the past few years, and it has resulted in discoveries of great importance. Some very large deposits of ore have been found. It also has been found that the ore bodies extend to much greater depth than had been imagined. Latterly, 22 "forties" have been taken under option by a Marquette mining man who is understood to be acting in behalf of important steel interests in the east. These lands are two to three miles northwest of Iron river, and it is understood they are to be drilled at once. Much new exploration is scheduled in the Crystal Falls district of the Menominee range also. A noteworthy campaign in this respect is that which contemplates the thorough prospecting of the so-called Porter-Carpenter lands. Five diamond drills have, in fact, already been put in commission. Geologists and mining engineers, representing various interests, have been looking over the territory in and adjacent to the Crystal Falls district the past few months, and options have been taken on a considerable number of desirable tracts.

It has been commented as rather strange that no mines have been developed in the 10-mile stretch of country between Iron Mountain and Commonwealth, in the central portion of the Menominee range. However, the territory has received only the most cursory exploration, and it is not recalled that diamond drilling has ever been done. Prospecting was recently started on the John S. McDonald lands, in Section 8, 39-19, near the Spread Eagle chain of lakes, on the Wisconsin side of the Menominee river. Cleveland interests are associated in the enterprise, and so are E. S. Small, of Florence, and G. W. Youngs, of Iron river. The property was explored by the owner of the lands himself more than a quarter of a century ago, and ore was found. As only high grade ore was in demand in those days, however, and as the McDonald product did not come within that class, operations were abandoned. Now the old shaft has been cleaned out and will be sunk deeper, and at the same time a churn drill, already installed, will be operated. Oglebay, Norton & Co., Cleveland, have been exploring an adjoining tract for the past year or more, and have met with much encouragement.

New Wire Mill.—The Southern Iron & Steel Co. has decided to build new rod, wire and nail mills at Gadsden, Ga., where its steel plant is now located. The rod mill will cost about $1,000,000 and contracts for the work at Gadsden have been let to the Garrett-Cromwell Engineering Co., Cleveland. The mills are expected to be complete by Jan. 1. The company's program involves the abandonment of the mills at Ensley, Ala. In order to secure the transfer, the city of Gadsden gives a bonus of $150,000 and grants a 10-year exemption from taxes. The principal officers of the company are James C. Woodward, president of the Hanover National bank, New York, chairman of the board; W. H. Hassinger, president; W. W. Miller, vice president; F. B. Keiser, vice president, in charge of operation; and A. R. Forsythe, secretary and treasurer.

OPEN-HEARTH INSTALLATION

At Duquesne Completed — Bessemer Converters Replaced.

The Carnegie Steel Co., Pittsburg, has completed the construction of 18 additional 60-ton basic open-hearth furnaces at its Duquesne works and has put the new capacity in operation. Work upon the construction of these furnaces has been progressing for the past several years. The first group of six furnaces was completed and fired about one year ago, and the final work was done recently upon the remaining 12. The Duquesne works now have a total of 34 basic open-hearth furnaces of which 18 are of 60 tons and 14 of 50 tons capacity. The plant was originally devoted to steel manufacture by the Bessemer process, but the two 10-ton converters were abandoned and dismantled when construction on the 18 open-hearth furnaces was begun. The first open-hearth unit of 14, 50-ton furnaces was built after the original installation of the Bessemer converters, and the works have produced both Bessemer and open-hearth steel. At the present time it is strictly an open-hearth plant. The steel in the Duquesne works is rolled into merchant bars, billets, blooms, slabs, sheet bars and splice bars. A new blast furnace at the Duquesne group is about completed. With the construction at Duquesne and the 12 open-hearth furnaces just erected and started at the Ohio works, Youngstown, the Carnegie Steel Co. now has an open-hearth steel capacity of 134 furnaces. Its Bessemer equipment at the present time consists of 16 converters at seven plants. No important additional construction work is now under way.

PROFIT-SHARING PLAN.

The stockholders of the Youngstown Sheet & Tube Co., Youngstown, O., have agreed to the profit-sharing plan recently proposed by President James A. Campbell, under which a sum varying from $200,000 to $400,000 a year will be distributed among the employes of the company in amounts based on the earnings of each man. The details of the plan have not been determined, but it is settled that the union men, with whom a wage scale has been signed, will not be allowed to participate. The stockholders also elected the following directors: J. A. Campbell, H. H. Stambaugh, H. G. Dalton, John L. Severance, C. D. Hine, J. G. Butler Jr., George D. Wick, Robert Bentley, E. L. Ford, William Wilkoff and Richard Garlick.

Additional Capital.—The Republic Iron & Steel Co. has authorized the sale of the unissued portion of its $25,000,000 preferred stock at par. The issue will amount to $4,583,100. In the circular announcing the increase, the executive board says the money will be used for property extension, mineral development or other purposes to be approved by the board of directors or the executive committee. Stockholders of record, Aug. 7, will have the privilege of buying the new preferred stock to amounts up to 9½ per cent of their present holdings, in common or preferred stock, up to 3 p. m., Aug. 20. Subscriptions for all the stock offered have been underwritten by Blair & Co., New York, and the syndicate formed by that firm will take all the stock not taken by stockholders. The new tube mill at Hazelton, O., already authorized, will require a part of the money raised by the issue and it is expected that the company will provide open-hearth capacity in the Youngstown district.

The Illinois Steel Co. has contributed $5,000 to a fund for paying off the debt of the South Chicago hospital. E. J. Buffington, chairman of the board of the steel company, sent a letter with the remittance agreeing to give further assistance if it should be needed.

AMONG MACHINERY MAKERS.

NEW YORK.

Large Volume of Business Closed in July by Machine Tool Builders.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Aug. 3.

The month just ended has proved the most satisfactory, both in point of business booked and in the improvement of general conditions, since the beginning of the depression. One of the largest machine tool manufacturing interests in the country, producing both heavy and light classes of product, reports the month as by far the largest in its history and still has negotiations on for a large amount of equipment which will aid in making a creditable showing for the current month. Even those interests which did not share in the extensive railroad purchasing, detailed in these columns during the last three weeks, have found the general run of business extremely active and in certain lines are having difficulty in making deliveries. The call for automobile-making equipment shows no let-up and every indication is that heavy buying will continue, to make possible the increasing output of cars already assured for 1910. Prices continue about the same, though individual manufacturers here and there are announcing small advances.

As predicted in this letter a week ago the Delaware, Lackawanna & Western has closed on practically all the items of the large machine tool list circulated early in the year for equipping the new shops at Scranton, Pa. This list involved about $120,000 worth of tools. The entire crane order was secured by the Shaw Electric Crane Co. through the local office of Manning, Maxwell & Moore, Inc. This includes 13 cranes, some of which are small but ranging up to two of 120 tons capacity each. The Shaw Electric Crane Co. has also booked an order from the Pullman Co. for its new shops in Chicago district, calling for a total of 13 cranes, including several of considerable span.

In addition to its recent heavy purchases of machine tools, the American Locomotive Co. has sent out specifications on about 40 cranes, principally for the Dunkirk works, but partly for the Pittsburg and Richmond shops. It is anticipated that an early decision will be reached on this large inquiry. The Erie is also in the market for some small jib cranes for its Meadville shops.

Announcement has been made that a part of the $5,000,000 issue of notes, shortly to be circulated by the Bethlehem Steel Co., will be used in materially increasing the open-hearth furnace capacity of the plant at South Bethlehem. Inasmuch as the finishing mills of this interest have been badly handicapped during the recent rush of business because of insufficient open-hearth capacity, this addition is likely to be made in the early future. It will involve a heavy expenditure.

A large contract for equipping a small arms factory of the Australian government has just been secured by the Pratt & Whitney Co. under conditions which speak well for the American manufacturer. The order was placed in London after a special expert had been sent to England to investigate the subject. Three bids were entered, that of the Pratt & Whitney Co. and of one other competitor being almost the same, while the third was very much higher. The competition naturally resolved itself into a question of efficiency, and the Pratt & Whitney Co. demonstrated that it could make a gun in just about one-half the working hours required by either of the competitors. The plant is to be delivered in Australia in one year from the date of the contract. The matter was handled by Walter L. Clark, vice president of the Niles Bement-Pond Co.

The regular fall meeting of the National Machine Tool Builders Association will be held at the Hotel Imperial, New York City, Oct. 12 and 13.

Among orders recently booked by the Shepard Electric Crane & Hoist Co., Montour Folls, N. Y., is one for six electric hoists for the Laconia Car Co., Laconia, N. H., another for 20 for the York Mfg. Co., and a third calling for 38 for the Virginia Bridge & Iron Co., Roanoke, Va.

Extensive additions will be made to the mill formerly operated by the Western Foundry Supply Co., Elizabethport, N. J. This has been acquired by a newly incorporated concern, Robert Gilchrist & Co., 50 Church street, New York City. Additional machinery will be installed for the grinding of ferro-silicon and ferro-manganese.

The Hyatt Roller Bearing Co., Harrison, N. J., has begun construction work on a four-story addition to its plant. The first floor of this building, which is 50 x 100 feet, will be employed as a hardening department, giving greatly increased facilities in this direction. The second floor, which will be used for offices, will be finished in handsome style; the third floor will be used as a tool room and the fourth for general manufacturing. The additional equipment required has only partly been purchased.

CLEVELAND

Manufacturers Extending Plants—Demand for Machinery Continues Insistent.

Office of THE IRON TRADE REVIEW, Browning Building, Aug. 3.

The general tone of the machine tool market is good, considering the season. While prices are still far from the 1907 level there seems to be plenty of business. The best indication of this is the amount of building that is being done by local manufacturers who are enlarging their plants. This is done, not so much for what the present holds as for what the future promises. With indications pointing to the best crops in the history of the country and a settlement of the tariff question, together with the restoration of confidence, the feeling is prevalent among manufacturers that the autumn months will bring a marked improvement in every line. This feeling of optimism is apparently not without foundation, for in many lines the usual summer slump has not materialized this year. In many cases, manufacturers, who have always taken advantage of the midsummer lull to shut down their plants, in part, at least, for repairs and general overhauling, have found themselves so rushed with orders that they have been forced to postpone repairs indefinitely.

The automobile business continues to be the prevailing influence in the industrial world, at least insofar as manufacturers of machine tools and drop forgings are concerned, but not to the same extent that it has been during the past 18 months. General business is beginning to demand its share of manufacturers' time, with the result that automobile builders are not able to obtain the finished material with the same facility as heretofore. Inquiries for machine tools are being received with a satisfying steadiness, although in most cases orders booked are comparatively small. The demand for large tools is light, but the prospects are that this condition will not last much longer. Several good-sized orders for heavy machinery are

being held up temporarily. The demand for second-hand tools is strong, and comes largely from small machine shops doing general repair work. The supply is much smaller than the demand in this line, however, and only occasional requirements are being filled.

Wyman & Gordon, manufacturers of drop forgings, report that their order books are filled for six months ahead. This firm has been contemplating the installation of a new power plant, but owing to the amount of business that it has on hand, this concern has found it necessary to defer action. A 200-horsepower boiler was recently installed, however, as an absolute necessity, and it is understood that the company will soon be in the market for a 3,000-pound steam hammer.

The Acme Machinery Co. advises that its business has been constantly improving during the past few months, and until now its volume of business is about equal to that of the corresponding season of 1907.

The Cleveland Stamping & Tool Co. reports that the amount of business that it has done so far this year is in excess of that done during the entire year of 1907.

The Imperial Steel Range Co. advises relative to its recent incorporation that this was done merely to facilitate the handling of its business, and that no change has been made in the management. The company reports that its volume of trade is better than at any time during the past two years and that it anticipates a highly successful season.

The Sidney Tool Co., Sidney, O., manufacturer of wood-working machinery and blacksmith tools, has recently increased its capital stock for the purpose of enlarging its business. The company has just completed a new addition to its factory, in which a full equipment of machine tools has been installed.

The Osborn Engineering Co. is working on plans for an immense grand stand to be erected on the grounds of the Cleveland Base Ball Club. The stands are to be double-decked, the lower deck concrete, the upper of steel construction, and will have a seating capacity of 18,000. Although bids for the structural material were received several days ago, no order has ben placed as yet. Bids for the contract work will be called for in about a week. The structure will cost approximately $125,000 and 1,000 tons of steel will be required.

The business of the Bishop & Babcock Co. has prospered to such an extent this year that this concern has found it necessary to build an addition to its plant. The new building will be 335 feet long, 54 feet wide, and five stories high, of mill construction with brick walls. It will be used exclusively by the wood-working department. The plans are being made by the Osborn Engineering Co., Cleveland.

BUFFALO.

Machinery Market Quiet—New Enterprises Contemplated.

Office of THE IRON TRADE REVIEW, 932 Ellicott Sq., Aug. 3.

A prominent feature of the machinery market is the interest shown in the Augustine automatic rotary engine, which was invented and developed in Buffalo by Benjamin F. Augustine. After years of experiments and tests, the engine has finally come upon the market, and in a comparatively short time the number of orders booked exceeded the capacity of the factory on Northampton street, this city, and three other shops are now filling orders for 54 Augustine rotary engines. Numbered among the recent orders booked are the following: Dodge & Bliss Co., Jersey City, one 100-horsepower, automatic cut-off for Tonawanda, N. Y., power plant; Spencer-Kellogg Co., Buffalo, one 15-horsepower, automatic cut-off, for centrifugal pump; Christian Becker, Buffalo, one 15-horsepower; Dunkirk, N. Y., board of public works, one 20-horsepower rotary engine to connect with Sirocco fan, forced draft; Wheat's Ice Cream Co., Akron, N. Y., one 20-horsepower rotary engine. A considerable number of engines of this type have already been delivered by the company and are now in operation. The Augustine Automatic Rotary Engine Co., 738 Ellicott square, Buffalo, has planned for the early construction of a plant of extensive facilities for the manufacture of engines, having already far outgrown its present plant. A disdinctive feature of the proposed factory lies in the decision of the company to dispense with overhead shafting, floor shafting and belting. Every machine in the plant will be independently driven by an Augustine automatic rotary engine. In this respect, the factory will be unique. The engines will be built in various types adapted for use in power plants, traction vehicles, motor boats, automobiles, etc.

The general tone of the machinery market is quiet, with indications that substantial business will be placed soon. There are numerous factory projects which will require large equipment of machine tools and power plants. It has not been determined by the Lackawanna Bridge Co. whether its plant in Buffalo, now being constructed, will be operated by Niagara Falls power or steam. The question is now up for consideration.

The Allis-Chalmers Co. has installed the flour mill machinery and electric apparatus for the new blending plant of the Pillsbury-Washburn Flour Mills Co., at Buffalo. The plant will be placed in operation immediately, with an output of 1,000 barrels daily. A 100-horsepower motor, Niagara Falls power, will drive the machinery. The Great Southern Lumber Co., Buffalo, has purchased a 1,000-kilowatt turbine with electrical equipment for its Louisiana plant.

A number of tin mills, it is reported, will be built by English capitalists at Niagara Falls, Ont.

MILWAUKEE.

Machinery Manufacturers Report a Large Volume of Business Closed During July.

Milwaukee, Wis., Aug. 3.—Figures for July show that the majority of machinery manufacturers in Milwaukee experienced the best month in their existence, while the remainder, consisting of the conservatives, report the best month in at least 18 to 20 months. From this it is safe to say that July exceeded any previous month in the volume of business and production. At least 30 per cent more business was done on the average during the first half of 1909 than for the same period in 1908. The number of men employed has increased in approximately the same proportion. At least 15,000 more men are employed in Milwaukee factories of all kinds at present than at the same time in 1908. The largest iron and steel manufactories in Milwaukee present the following approximate figures as the percentage of gain in orders: Allis-Chalmers Co., 33 to 45 per cent; Davis Manufacturing Co., 400; Vilter Manufacturing Co., 25; Northwestern Malleable Iron Co., 25; Filer & Stowell Co., 30; Cutler-Hammer Co., 30; Illinois Steel Co., 60; Crucible Steel Casting Co., 25.

The somewhat sensational increase reported by the Davis company is explained by this statement from an official of this concern: "We have been running night and day since February and orders on books will demand the same speed at least a year more. We have four times as much business on hand as in the first half of 1908, with orders for $400,000 worth of motors and engines for automobiles and boats.

We are arranging to greatly increase our capacity. We are employing 50 per cent more men than last year. If automobiles mean prosperity, then prosperity is here for certain."

Another gratifying feature of the situation is the call issued last week for 400 unskilled workmen by the Wisconsin free employment bureau. The demand for able-bodied men for track elevation, general railroad work and other jobs where muscle rather than skill is desired, is unabated and cannot be filled.

The Allis-Chalmers Co. has received its eleventh order from the Pittsburg Plate Glass Co., for a steam turbine of 500 kilowatt capacity.

The Depere (Wis.) Advancement Association has deeded, gratis, 100 feet of land on Ninth street to the Lyons Boiler Works to provide for future additions. The land adjoins the Lyons plant. Nothing definite has been announced as to the proposed additions.

The C. A. Lawton Co., gasoline engine builders, Depere, Wis., has purchased the two-story brick building with 57 feet frontage, opposite its plant and will use it for a storage warehouse.

General Manager J. A. Vail, of the Fairbanks-Morse Mfg. Co., Beloit, Wis., says: "Business is again normal and orders are coming in at a nice rate, last week's business being especially gratifying. All reports are very encouraging. All that I am afraid of is that the recovery has been too rapid to be healthy. We intend to do considerable building this season. I am able to announce the following: Addition of 100 feet to erecting shop; addition of 100 feet to paint shop; addition of 75 feet to warehouses. Next year we expect to do better."

The G. B. Lewis Co., Watertown, Wis., has finally decided to rebuild the plant destroyed by fire two months ago. It manufactures bee keepers' supplies, boxes, etc. The main plant will be 209 x 80 feet, one-story, with steel trussed roof; main warehouse, 200 x 80 feet and a power plant. The equipment will be entirely new. The Milliken Co., Indianapolis, is drawing the plans.

The Stoughton (Wis.) Wagon Works are erecting a 36 x 48-foot addition to the blacksmith shop to be used for making bolster springs. New machinery costing $5,500 will be installed.

The Hoehne Machine Works, Kaukauna, Wis., have successfully made their first cast in the new foundry. The initial heat was 2,000 pounds.

The Wisconsin Hydro-Electric Power Co. has obtained permission from the secretary of war to build a dam across Wisconsin river at Prairie du Sac, Wis. Magnus Swenson of Madison is president of the company, which is nearly identical in ownership with the Southern Wisconsin Power Co., Madison.

The Racine Mfg. Co., Racine, Wis., has purchased several lots adjoining its plant and also that of the Piggins Bros., automobile engine and motor builders, and ground has been broken for a five-story building. It is reported that the Racine company and Piggins Bros. will be merged and the automobile business entered into extensively.

The Oshkosh Gas Light Co., Oshkosh, Wis., is installing $50,000 worth of machinery, including a 500-kilowatt generator, of 1,200 horsepower capacity, driven by a Parsons or horizontal type steam turbine, all manufactured by Allis-Chalmers Co., Milwaukee.

The Hotel Foests at Sheboygan, Wis., is building a powerhouse, 25 x 60 feet, to contain two high pressure boilers, two ice machines and dynamos. The Metal Concrete Chimney Co., St. Louis, has the contract for a 95-foot chimney.

Following a general strike in the N. R. Allen Sons' Co. tannery, during which the activity of the 1,500 employes necessitated the order from the governor to several companies of infantry and cavalry to hold themselves in readiness for immediate service, the 275 employes of the foundry of the Simmons Mfg. Co., Kenosha, walked out on July 27 to obtain a readjustment of the piece work scale. There has been no violence and an early settlement is anticipated. The 20 per cent reduction of the fall of 1908 is still in effect.

The Milwaukee Aluminum Mfg. Co., Reed and South Pierce streets, aluminum and brass founder, has awarded contracts for the erection of a new foundry, 34 x 140 feet, two stories high, to be ready Oct. 1.

A charter has been granted to the Oshkosh Steel Construction Co., Oshkosh, Wis., to build steel and concrete bridges, viaducts, etc. C. F. Mundill, M. S. Mundill and W. A. Hayes are the incorporators.

John Todell, general foreman of the pattern and machine department of the J. I. Case Plow Works, Racine, Wis., has resigned to become master mechanic of the Rock Island Plow Co., Rock Island, Ill.

The College of Engineering, University of Wisconsin, has announced the following new appointments to the faculty: C. G. Burritt, instructor of railway engineering; W. C. Muehlstein, assistant; J. A. Cutler, instructor of topographical engineering; B. S. Wood, instructor in woodwork; George B. Blake and S. S. Hovey, assistant instructors in electrical engineering.

Oscar H. Stuewe, secretary of the Milwaukee Woven Wire Works, was badly injured last week, his automobile being struck by a street car.

PITTSBURG.

Machinery Conditions Continue Favorable—Inquiry for a Large Number of Cranes.

Office of THE IRON TRADE REVIEW, 510 Park Building, Aug. 3.

Numerous extensive improvement plans of iron and steel works and industrial shops continue to hold the attention of machinery builders and a very fair volume of business is now being offered from these sources. Considerable estimating work is also being done upon extensions and new plant construction which are yet in the preliminary stage. The heavy machinery situation is favorable and the better tone is extending to machine tools and other lines. Some large business in cranes has been placed and important inquiries are out including one for 35 travelers which is about to be placed. New steel works construction in this district is providing a good demand for cranes and several contracts have been let recently while others of a similar nature are pending. The pneumatic tool makers report an especially brisk demand, railroads and car shops buying more freely than they have been for the past two years.

One of the largest single inquiries now before the machinery trade is that for 35 cranes of various capacities to be installed in the extensive additions which the American Locomotive Co. is making to its Dunkirk, New York, plant. It is expected that this order will be placed within the coming week.

The American Plate Glass Co., Kane, Pa., is installing a 700-horsepower, Westinghouse horizontal gas engine for power purposes, and has also contracted for a 16 x 26-inch, twin-tandem horizontal Westinghouse engine to be direct-connected to a 400-kilowatt generator. The Torrington Electric Light Co., Torrington, Conn., is adding a 500-kilowatt Westinghouse turbine-generator set to its power station equipment, and the Sea View Railroad Co. has installed in its Hamilton, R. I., power station two 400-kilowatt Westinghouse turbines driving Westinghouse three-phase 60-cycle, 360-volt alternators. This equipment is additional to a set of horizontal cross-compound reciprocating engines driving Westinghouse generators, already installed. At the

Bernon mills of the Manville Co., Georgiaville, R. I., a 300-kilowatt Westinghouse low-pressure turbine is being installed to take steam at atmospheric pressure from the exhaust of a Corliss engine.

Wm. Swindell & Bros., German National Bank building, Pittsburg, have closed contracts with the Fort Pitt Malleable Iron Co., McKees Rocks, Pa., for the erection of three open-hearth steel melting furnaces and 10 Swindell annealing furnaces. Other contracts taken include a soaking pit and one crucible steel melting furnace for the Firth-Sterling Steel Co., Washington, D. C., one regenerative furnace for the A. M. Byers Co., Pittsburg, two large gas-fired Swindell annealing furnaces for the Superior Steel Co., Carnegie, Pa., and two heating furnaces for the Singer Mfg. Co., Elizabethport, N. J. The company has recently completed the entire furnace equipment, consisting of heating and annealing furnaces for the new plant of the Ohio Seamless Tube Co., Shelby, O., and has received a number of orders for Swindell reversing valves.

The Liberty Mfg. Co., Pittsburg, manufacturer of oil filters, tube cleaners, etc., is planning the erection of a new addition which will contain a machine shop and finishing department.

The Carnegie Dock & Fuel Co., a subsidiary company of the Carnegie Coal Co., Pittsburg, is awarding contracts for the construction of a large coal-handling dock at Superior, Wis., which will have a capacity of more than 1,000,000 tons annually. The latest type of electrically-operated coal-handling machinery will be installed including three steel bridges, two for carrying bituminous and the other for anthracite. These will be fitted with 5-ton grab buckets.

The activity of the Jones & Laughlin Steel Co. in constructing its new steel works and finishing mills at Aliquippa, Pa., continues to provide one of the principal sources of machinery orders in this district. A contract has been awarded to Pawling & Harnischfeger, Milwaukee, for the several cranes required for the new tin plate plant. The company has also closed for a large number of gas producers for its open-hearth department. The Morgan type will be used.

The Morgan Construction Co., Worcester, Mass., has taken a large contract for equipment required in connection with the 60-inch plate mill at the Gary works of the Indiana Steel Co. The machinery includes cooling equipment, tables, transfers, etc.

The General Chemical Co., New York, is about to erect an extensive chemical plant at Newell Station on the Pittsburg & Lake Erie railroad about midway between Fayette City and Brownsville, Pa. The plant will be of very extensive proportions and will involve the expenditure of several millions.

CINCINNATI.

Heavy Demand for Machine Tools in July.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Aug. 3.

The month of July in the machine tool trade has equalled the month of June in point of orders and has in some of the lighter lines exceeded the record of June in this center, and there seems to be no question that the gradual increase in business is permanently established. Orders for castings are going to the foundries in more liberal quantities and the consumption of pig iron is steadily increasing. The shops are also making purchases of equipment and the whole tone of the trade is one of optimism. One of the best reports as to the increase in demand was made at the quarterly meeting at the Niles Tool Works Co., which was held last week, it being stated that the orders received by the company during June and July of this year exceeded those for the corresponding months in 1907.

A special representative of the British government is making an investigation of labor conditions in this country and has been visiting the machine tool shops and the local headquarters of the Metal Trades Association during the week. He attended the outing given on Saturday by the employers of the Cincinnati Metal Trades Association to their employes at Chester park, which has become an annual event. These outings have proven beneficial to both employers and employes.

WORCESTER.

News From Many New England Industrial Centers.

Worcester, Mass., July 31.—At a recent meeting, the stockholders of the Chapman Valve Co., Indian Orchard, Mass., voted to merge the company with the Pratt & Cady Co., Hartford. The meeting voted to issue $300,000 preferred stock to wipe out the indebtedness of the Chapman Co., and a further issue of $400,000 to buy the Pratt & Cady Co.

The Maxwell-Briscoe Motor Car Co., Pawtucket, R. I., has purchased the manufacturing plant formerly occupied by the Atlantic Rubber Shoe Co., South Auburn, R. I. New floors, new elevators, new machinery and new shafting will be installed. No rubber goods are to be manufactured.

The Winchester Repeating Arms Co., New Haven, are to build two new factories, two stories high, of reinforced concrete, 60 x 288 feet. The company will also build a mill 27 x 55 feet, and in all will spend about $150,000 in enlargements.

The John Dorsey Co., which started in Worcester to manufacture handles for edge tools, chisels and hammers, has outgrown its quarters and is now located in Putnam, Conn., under the name of the Dorsey & Bone Co.

H. M. Caruthers, Boston, owner of the United Handle & Mfg. Co., located at East Killingly, Conn., has purchased the plant of the Pressed Steel Car Wheel Co., Canton, O., and will there consolidate the handle plant together with a small plant in Vermont.

The Frisbie-Heft Motor Co., Middletown, Conn., is installing special machinery. It will manufacture automobiles.

The R. L. Morgan Co., recently incorporated, and which manufactures R. L. Morgan's new motor truck, has just received an order from the American-South African Commerce Co., Johannesburg, South Africa, for 100 trucks, the order amounting to $350,000. The Morgan company think the order is likely to be increased. The first car will be ready about Sept. 1.

The North & Judd Mfg. Co., New Britain, Conn., makers of saddlery hardware and buckles, is adding a one-story brick addition, 60 x 150 feet.

The Pequonnock Foundry Co., Bridgeport, has bought two acres of land for a new foundry site. The main building will be of concrete and steel construction.

SOUTH BALTIMORE STEEL CAR & FOUNDRY CO.

At a receiver's sale, July 27, the South Baltimore Steel Car & Foundry Co.'s plant, Baltimore, Md., was taken over by the creditors and an announcement was made that the concern would be reorganized and operated. A new stock company to be known as the Baltimore Car & Foundry Co., with a capital of $1,500,000, is proposed. The plant has been running under the management of the receivers with about 900 hands employed. When fully in operation the plant can give employment to 2,500 men and has a capacity of from 35 to 40 cars a day, which in prosperous times was forced to 50 cars.

EXTINCT IRON INDUSTRY IN SOUTHERN ILLINOIS

The Iron Ores of This District Correspond Closely With Those Found in Western Kentucky and May Form a Future Source of Supply

By Henry E. Birkinbine.

At the present time, when in discussions of natural resources much is said and written concerning iron ore supplies and reserves, it may be of interest to direct attention to some of these which either have not been exploited, or, having been actually developed, are now lying dormant, if not forgotten.

Iron ores have been won, or are known to exist, in nearly every state of the Union, but many deposits, which served as sources of supply for the initial efforts to establish an iron industry in the United States, are now unused. Such is the case with those which sustained the first iron works in Virginia, New Jersey and New England; in Pennsylvania, however, the magnetic ores, upon which the earlier iron works depended, are either nonproducing or are temporarily inactive, and some brown hematite and red hematite ore mines east of the Allegheny mountains are dormant. But few of the carbonate ores, upon which was built the original iron industry of Ohio, are now used, and in a number of other sections of the country deposits of iron ore, which in earlier years supported industries, are inactive; in fact, the knowledge that such industries existed has passed from the majority of the people.

These facts were brought prominently to attention by an inspection made by the writer and his brother, J. L. W. Birkinbine, of deposits of iron ore in southeastern Illinois, which formerly maintained a development in iron manufacture and may again be called upon to contribute to the supply of our blast furnaces.

Blast Furnaces in Southern Illinois.

About a half century ago two blast furnaces were active in Hardin county, Ill.; producing pig iron from local ores smelted with charcoal, and the ruins of these plants are still in existence. The ores used were carbonates and brown hematites, found in a coal-bearing area.

From 1839 to 1873 the pig iron industry in southern Illinois was confined to two plants, according to "History of the Manufacture of Iron in All Ages," by James M. Swank, who states:

"In 1839 a small charcoal furnace was built four miles northwest of Elizabethtown, in Hardin county, in the extreme southeastern part of Illinois. * * * It was called Illinois. This is the first furnace in the state of which there is any record, and it probably had no predecessor. * * * In 1873 this furnace, after having been out of blast for several years, was repaired, but it was never again active."

When visited, part of the stone work of this furnace stack had been torn down or had fallen away, but the brick lining, although out of shape at the top, was entire and the arches were in good condition. On the crest of the hill, at whose foot was situtaed the furnace, were several piles of ore and charcoal waste, inquiry bringing out the fact that the blowing apparatus had but lately been removed.

In regard to the other furnace, Mr. Swank continues:

"A charcoal furnace called Martha, also in Hardin county, was built in 1848 * * * about 2 miles east of Illinois furnace. It was probably the second furnace in the state. Illinois and Martha furnaces were both in blast in 1850, but in 1860 Illinois only was in blast. Martha had not been in operation since 1856, and it probably never made any iron after that year. It has long been abandoned."

The site of this furnace revealed a tumbling ruin, overgrown with vines and brush, as the remains of the plant, which was reported "capable of producing 2,500 tons per annum."

Charter of Saline Coal & Mfg. Co.

An examination of the charter and prospectus of the Saline Coal & Mfg. Co., and of some old reports made to the directors of the company and published about 1855 by the late Dr. David Dale Owen and Edward D. Mansfield, presents interesting features which appear worthy of repetition.

In view of the limited development of the middle west 58 years ago, the charter, dated Jan. 28, 1851, evidences foresight on the part of the incorporators; for it gives the company power to "receive, buy and hold such real estate, mining rights and rights of way as may be deemed necessary by them to the successful prosecution of their business, * * * to lay out and construct * * * wagon roads, railroads, and appurtenances thereto, * * * to erect dams and construct docks on the Saline river, * * for the improvement of the navigation of said river, * * * and to engage generally in the business of the welling for salt water; and for the mining of coal, iron, clays and other minerals; and for the manufacture, sale and transportation of the products of their wells, mines and such other commodities as the company may think promotive of its welfare."

The prospectus asserts: "The property of the Saline Coal & Mfg. Co. * * * embraces all the seams of the lower coal measures of the central bituminous coal field of the Mississippi valley, usually called the Illinois coal field, including also the seams of carbonate of iron pertaining to this coal formation." It also states that the sandstone ridge, dividing the headquarters of Big Creek from those of the little Saline, is "the division between the coal formation and the carboniferous limestone which bears the brown hydrated oxide of iron, or hematatic ore, which occurs on the estate of the company, immediately adjoining this ridge. The valleys of the stream and the depression of the ridge afford easy grades for a railroad to connect the hematatic iron ore with the coal field."

Conditions in 1855.

Interesting at the present time are the following quotations of conditions as they existed in 1855, according to a report of the president and directors of the Saline Coal & Mfg. Co.: "We are in the very center of over 16,000 miles of river navigation, and of about 11,000 miles of finished railroads in this valley; and in the center of a population of more than 12,000,000 of inhabitants, requiring goods manufactured from the above materials.

"Extensive forests of white oak are owned by the company, of a quality unsurpassed, which is worth from $5 to $10 per 1,000, board measure, more in the English, French and New York markets, than any other white oaks."

Dr. David Dale Owen, in his geological report, stated: "If ever the luxuriant primitive forest should fail to supply the timber necessary for the production of charcoal, to reduce the ores that may be worked, a supply of coal is at hand to take its place, which

thousands of years cannot exhaust."

That the promoters were not averse to letting others participate is evident, and that the town boom feature was recognized one-half century ago is demonstrated by the claims in the prospectus: "Regarding this region as the most central in the United States, with reference to consumption, where coal and iron could be found in close proximity, upon navigable waters, and determining from the commencement successfully to achieve a result in the production of coal and iron, which should be not only creditable to American enterprise, but highly remunerative to the capital invested, a large tract of mineral property had to be purchased from various parties.

"Having acquired all the real and mineral estate necessary, to give permanency to the mining and manufacturing interests contemplated, as well as the most eligible site for a commercial and manufacturing town, on the banks of the Ohio river, * * * we invite capitalists to put their money with ours, for the further development of this estate. * * * The amount of improvements is so disproportioned to the mineral resources of the property, that we would gladly accept further tenders to the amount of $1,000,000, or, at most, $1,200,000.

"This addition to our capital would enable us greatly to extend our coal product; would build four blast furnaces and one rolling mill; would develop our salt to a production of 500 bushels per day, and give us an ample money capital for the conduct of the business of the company."

Mr. Mansfield introduced a table of the growth of cities, giving figures for 1830, 1840 and 1850, to which have been added statistics from the tenth, eleventh and twelfth census, for 1880, 1890 and 1900, to illustrate how the sections, which were considered tributary to southern Illinois, have since developed. The now important city of Cincinnati* was not mentioned by Mr. Mansfield, although, as indicated, its population in the years he considered was greater than that of any of the towns named.

Towns.	1830.	1840.	1850.	1880.	1890.	1900.
Cleveland, O.	1,000	6,071	17,034	160,146	261,353	381,768
Toledo, O.	200	1,222	3,829	50,137	81,434	131,822
Springfield, O.	1,080	2,062	5,108	20,730	31,895	38,253
Evansville, Ind.	.....	1,000	3,235	29,280	50,756	59,007
Covington, Ky.	500	2,500	9,408	29,720	37,371	42,938
Wheeling, W. Va.	5,221	7,885	11,435	30,737	34,522	38,878
Dayton, O.	2,954	6,067	10,977	38,678	61,220	85,333
Pittsburg and vincinity, Pa.	15,369	31,204	78,702	235,071	343,904	451,512
*Cincinnati, O.	24,831	46,338	115,435	255,139	296,908	325,902

The property of the Saline Coal & Mfg. Co., which was "a corporate body, having a perpetual charter from the state of Illinois, with most ample powers and provisions," was situated in Hardin and Gallatin counties, in the southern portion of the state of Illinois, on and near the Ohio river, about 100 miles above its junction with the Mississippi river. The property extended for two miles along the Ohio river to the mouth of the Saline river, and along the latter for over 18 miles, and was reported to consist of over 14,000 acres.

The front on the Ohio river was stated as "a bold and good landing, at all stages of the water," and the Saline river was reported "at high water navigable to Equality, about 17 miles above its mouth, and at the lowest stages for about three miles, and as deep as the channel of the Ohio—which backs its water thus far—providing a basin of still water, three miles long by 300 feet wide, in which all kinds of craft may lay with as much security as they could do in the Liverpool docks."

Illinois Ore.

In the geological report of Dr. Owen (who the prospectus claims "examined the property repeatedly and most thoroughly") the ores are described as "principally carbonates of the protoxide of iron, more or less bituminous, and containing variable quantities of earthy matter," occurring in thin bands between the black shales, containing iron ranging from 7.7 per cent to 43.76 per cent. In addition to the above, which are "interstratified in the coal measures of Gallatin county, Hardin county affords extensive deposits of hydrated brown oxide of iron, or hematites, forming the various varieties known to the iron master under the names of honey-comb ore, pipe ore, pot ore, etc. These ores occur in a different geological formation from those previously described, being uniformly in connection, though never interstratified with the subcarboniferous limestone lying west of the coal measures."

In working the ore banks of the Illinois and Martha furnaces, which were usually on the declivities of hills, the ore was found between well defined walls of limestone, the width of the deposit varying from 24 to 27½ feet, and the ore being followed to depths of from 60 to 90 feet, where the working was discontinued for the want of the necessary power to drain the accumulated water.

Dr. Owen also stated: "These hydrated brown ores of the subcarboniferous limestone formations of Hardin county, Illinois, are essentially composed of water and peroxide of iron, with occasionally a small admixture of protoxide, and insoluble earthy silicates."

The analysis of an average specimen from the ore banks of the Martha furnace yielded:

	Per cent.	
Water	10.8	
Siliceous earth, insoluble in hydrocht acid	5.0	
Peroxide of iron	80.0	= 56.02 Fe.
Alumina	3.7	
Loss and alkalies not estimated	0.5	
	100.0	

This ore, if economically worked in the furnace, should yield from 50 to 56 per cent of metallic iron. The quality of iron produced from these hydrated oxides of iron is similar to the iron from the Cumberland and Tennessee rivers in Kentucky and Tennessee, and the Housatonic river in Connecticut.

"In this district of Hardin county, there is a belt of country, two to three miles wide, ranging in a N. E. and S. S. W. curve through these townships, towards the mouth of Grand Pierre creek, which is the northern extension of the great co-temporaneous ferruginous belt situated between the Cumberland and Tennessee rivers."

Abandoned Mines.

On the property of the Martha Iron Co., a number of openings, pits, drifts, and shafts were examined, but the action of nature and the elements for half a century has obscured many of the evidences of ore, and the only satisfactory samples obtained were from dump piles or from portions of caved-in shafts. There were evidences of the ore having been roasted but not of its having been washed, and it is therefore probable that the more desirable lumps were sorted out and smelted.

Analyses of such samples as could be collected showed in the natural state iron contents from 31.24 to 54.57 per cent, with phosphorus ranging from 0.076 to 0.40 per cent, the average samples giving about 42.66 per cent iron, 0.214 per cent phosphorus, and 0.016 per cent manganese. It is probable that with washing appliances an ore averaging close to 45 per cent of iron could be obtained.

The Martha Iron Co.'s property has no railroad connection, but lies close to the Saline coal fields, and with the development of these the transportation may be more convenient. At present the only outlet is to the Ohio river, about four miles from the iron ore property, but F. H. Sellers, a civil engineer, in his report of Nov.

8, 1855, to the president of the Saline Coal & Mfg. Co., concerning a reconnaissance of the routes for the proposed railroads, stated: "There are no difficulties of any moment to be encountered on any of these routes, on all of which easy grades may be obtained," and estimated that the cost, with the exception of bridging, would not exceed $8,850 per mile with 35-pound rails.

In traversing the territory one was impressed with the rapidity with which the best efforts of man are hidden. The depressions and embankments from open cuts and drifts, made to exploit the ore, are now grown over, and with the tumbling ruins of two blast furnaces are left as the only traces of activity after a half century has passed.

Liberal excerpts have been made from the previously mentioned reports, now out of print, because they illustrate the conditions existing when the iron producing industry of Illinois was active. The extensive forests referred to have passed away, and the timber remaining is of second growth. The mineral, however, is left and, as the iron ores correspond closely with those found to the south in western Kentucky, and as the yield of iron when beneficiated will approximate the average of the ores smelted in the United States, these may form a future source of supply.

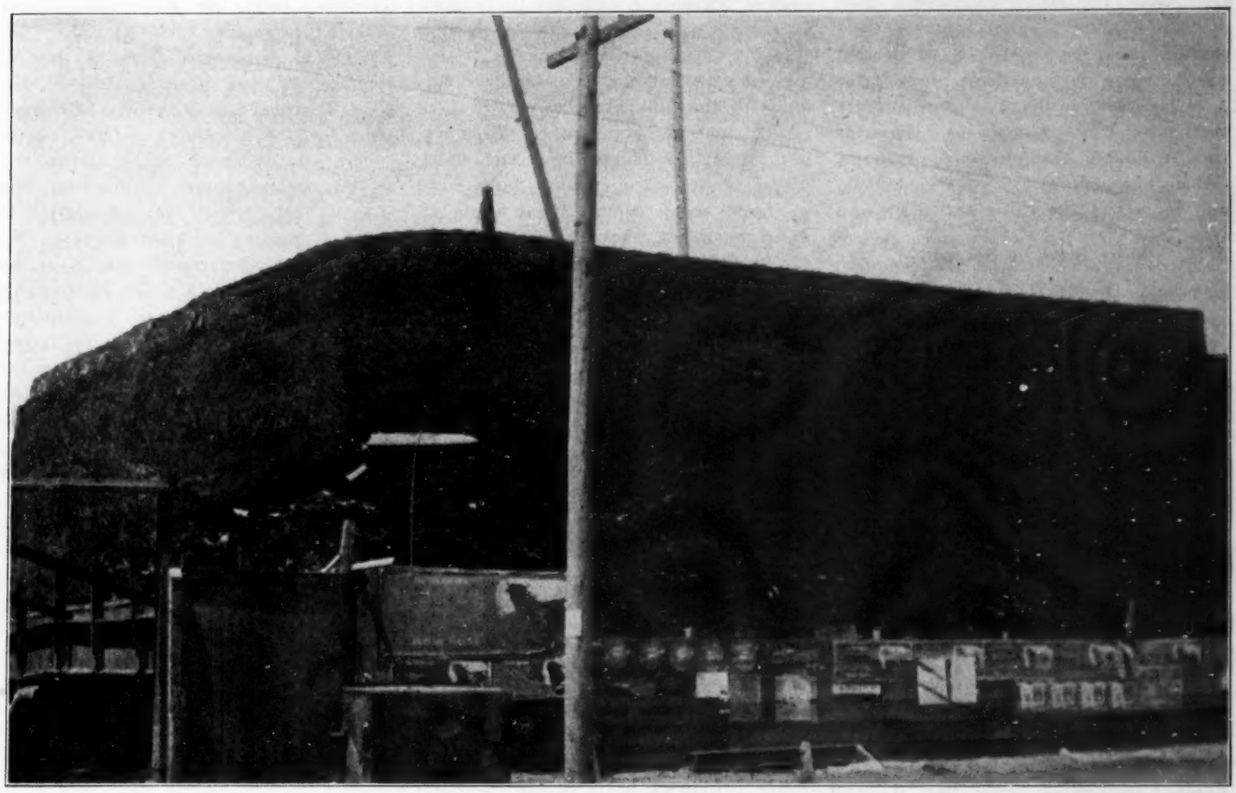
IMMENSE SCRAP HEAPS

At San Francisco—Their Origin, Rise and Decline—Some Long Shipments.

San Francisco, Aug. 2.—California is the possessor of the largest scrap heaps the world has ever known, relics of the great conflagration of April, 1906. The principal accumulations are those in the yards of the Great Western Iron and Steel Co., located at Folsom and Steuart streets. One scrap heap, the only one remaining intact of four of equal size and proportions, is 40 feet high, 100 feet square, and contains 20,000 tons, all cut in equal length of 18 inches, and piled in one solid mass, with the sides as smooth and solid as a brick wall. It measures 100 feet square, while the height is estimated from the known height of the 40-foot pole standing alongside the scrap heap. The four scrap heaps in that row contained about 80,000 tons. Only one remains in its original size and shape, the other three having been drawn upon as the material was needed. It required six powerful shears to cut the scrap ready for the furnace.

Since the fire, the Great Western Iron & Steel Co. has handled 150,000 tons, which constitutes the major part of all old material shipped or melted here. It has six large shears in operation to cut the iron and steel, either that it may be better handled for shipment or for the furnace. The same company has shipped two cargoes to Philadelphia and one to New York, and has a large quantity on hand. Besides the four heaps which are piled in ship-shape trim, there are other piles of uncut scrap, forming heaps, rearing their tops way above the high fence surrounding the scrap yard, but appearing insignificant at the side of the well-stacked scrap heaps which, as ordinary scrap, would cover acres of space.

Little of that scrap is used in San Francisco, while the bulk of it is shipped to the Atlantic coast or to European ports, only to be returned to San Francisco, in part at least, as a manufactured article. San Francisco and, incidentally, California, loses the money which would be paid here in wages for converting the scrap into fabricated articles, and has to pay the freight for hauling the scrap away and bringing the iron and steel back for use. But such are the labor conditions here, that the East and Europe can underbid our local manufacturers in their own home.



GIANT SCRAP PILE IN THE YARD OF THE GREAT WESTERN IRON & STEEL CO., SAN FRANCISCO.

Many Piles of Iron and Steel.

There are many scrap heaps piled about the bay awaiting shipment, heaps of various sizes, some as big as a house and others mere hillocks, scattered over acres of ground at the yards of the Judson Mfg. Co. in San Francisco and at Emeryville,

across the bay; at the Pacific Rolling Mills, the Pacific Coast Steel Co., Baker & Hamilton, in the railroad freight yards, and on the long wharf at the Oakland shore, piles and mounds of scrap are awaiting either the furnace, ship or freight car.

Among the extensive shippers of scrap may be mentioned Bates & Chesebrough, operating a clipper line of seven large steel ships, of 5,000 tons each, between San Francisco, New York and Philadelphia. Scrap iron is very desirable to load in the hold of the ship carrying a cargo made up pricipally of hops, wool, barley, salmon and other light stuff. The scrap is taken at a lower freight rate than the light cargo, but fills in and equalizes. When ample canned salmon, fruit and other solid freight offers, scrap is not desirable. Bates & Chesebrough have shipped more than 6,000 tons of scrap as filling for freight during the past two seasons. Other firms ship an equal quantity, and more, on the same terms.

More Scrap is Shipped.

George W. McNear & Co., agents for a French line of steamships, and extensive shippers from this port, have sent a few cargoes of scrap to Italian ports, to New York and Philadelphia. George McNear, the head of that firm, said that the bulk of steel scrap, such as railroad scrap, finds a better market in the United States than abroad. It is used principally west of the Mississippi by such steel plants as those of the Colorado Fuel & Iron Co. Cast iron and wrought iron are of greater value locally, and are used by plants on the Pacific coast. "Steel scrap," he said, "we export occasionally to Atlantic ports and to Italy, when freights are very low in the spring, or just before the grain crop and canned goods are being moved." McNear & Co. ship about 15,000 tons of scrap a year. They have shipped much more during the past three years.

Balfour, Guthrie & Co., another large shipping house, have shipped large quantities of scrap partly to England, to Italy, New York and Philadelphia. They have used a few thousand tons for ballasting merchandise on seven vessels, and shipped three full cargoes. A steel plant in Los Angeles has also taken several thousand tons.

History of the Scrap Heaps.

The embers had not died from the great fire of April, 1906, and the huge iron rafters and beams, twisted and bent out of shape, and almost melted, still too hot to be approached, when some enterprising men and boys commenced to "pick up" scrap in the burned district. Every lot in that vast district was littered with scrap iron and pipe, boilers, tubes and all sorts of metal used in buildings. There was so much scrap in the miles of empty lots from which the buildings had disappeared that no one cared or claimed the stuff. The ordinance against looting was not rigidly enforced by the police in those cases, because the gatherers of scrap had all sorts of excuses for taking the stuff which, at that time, appeared worthless, except for holding a rag roof over a temporary apology for a tent. In some cases, owners paid for having their lots cleared of scrap.

Soon enterprising men, either familiar with the junk business, or for lack of occupation, commenced an energetic hunt for scrap iron and steel. They hired wagons and boys and gathered scrap where they found it. In some cases, they paid a trifle for the stuff; in others, they obtained permission to take it away. Most of it was obtained for a mere song, and an army of youngsters dragged and hauled scrap to the dealer, receiving a few dimes for their trouble and labor. Not a few of the prudent men who engaged in that business found ready buyers, made fortunes within a few months. The business started at a season when scrap is in demand for filling vessels carrying cargoes of light material, and it pays to ship scrap in the hold.

The scrap heaps grew and diminished, according to the quantities accumulating and being shipped. But the business done by some of the most energetic and prudent dealers did not remain a secret very long. The enormous profits realized during the early period of the trade lured many others to embark in the business, and competition drove the prices of scrap to the limit. Most of the scrap has been disposed of, although very large heaps remain in some yards and on the wharfs, ready for shipment. The demand has diminished, and some dealers will be lucky if they realize cost on what they have on hand.

The scrap heaps are still a great sight for the stranger, but they are diminishing and soon will be no more than the ordinary size.

The Jefferson Iron Co., Jefferson, Texas, advises that while it is not in blast at present, it expects to be operating in 30 days.

ANNUAL REPORT OF THE WESTINGHOUSE ELECTRIC & MFG. CO.

The report of the Westinghouse Electric & Mfg. Co., Pittsburg, for the year ending March 31, 1909, has been published and shows a loss of $918,683 after the deduction of all charges. Notwithstanding the loss, George Westinghouse speaks in a hopeful tone of the future. The company was taken out of the receivership Nov. 30, 1908, and the executive committee was elected and organized the following January.

There was a decrease in the surplus amounting to $2,992,661.80, which is made up of the item of loss already mentioned, $460,490.16 for expenses in connection with the adjustment of the debt existing prior to Oct. 23, 1907; $265,883.32 as compensation to the receivers and their attorneys, and $1,347,605.41 charged off to reduce the book value of the company's assets.

The loss is stated to be chiefly due to the small volume of business, the use of high priced materials, sales at reduced prices and the expenses incurred in the departmentalization of the manufacturing operations of the company.

Changes in methods of manufacture have been made so as to greatly reduce the amount of materials, raw, in process of construction and finished, which the company must keep in stock for a given output; so that the item of $9,961,182.32 for material in stock, work in progress, goods on consignment, etc., is compared with $17,740,178.32 for similar items on Oct. 23, 1907, when the receivers were appointed.

From sales of stock, convertible bonds and notes the company has raised a total of $17,756,975 new capital and it is estimated that the company now has capital and facilities for an output of $50,000,000 annually. The company now has in its sinking fund $1,500,000 covering the requirements in that regard up to the end of the year.

The gross earnings were $20,606,592.04 from which $19,955,808.51 for cost of shipments is deducted, leaving a net manufacturing profit of $650,783.53. The income from interest and discount, dividends and interest on stocks and bonds owned, royalties and the manufacturing profit, etc., amounted to $1,966,258.65, and the difference between that sum and the deductions from income for interest on bonds, debentures and collateral notes, depreciation and miscellaneous charges gives the net loss already noted. The surplus at the date of the report was $8,980,334.60. The total assets of the company are $84,885,470 of which $23,662,163 are in cash, notes, accounts receivable and other current assets.

A TYPICAL HANGING ROCK CHARCOAL FURNACE

History of a Southern Ohio Stack Which, Producing Ten Tons Per Day, Paid For Itself Twelve Times Over in Fifteen Years.

Jefferson furnace, Jefferson Iron Co., Oak Hill, O. One stack, 40 x 10½, built in 1854; idle for several years; revived in 1901; warm blast; ores, native limestone and block from the company's mines; product, foundry pig iron; annual capacity, 3,500 tons. Brand, "Anchor." Charcoal pits are connected with the furnace. Active in 1907. * * * * * *

This is the reference in Swank's directory to what is perhaps the most interesting of the countless charcoal stacks which once flourished in southern Ohio and made the Hanging Rock district, comprising a half dozen counties along the Ohio river, a familiar name wherever iron was melted. Only three or four of these furnaces have survived the cutting away of the forests which then provided ample and convenient supplies of charcoal, and the next few years will certainly witness the end of their operations.

Jefferson furnace is of interest not only because it is typical of the better class of charcoal iron producers in the Hanging Rock district, but also because of some remarkable facts in connection with its early history and operation, which it is the purpose of this article to present. Doubtless the most remarkable is the fact that, with a capitalization of only $34,500, in 15 years the company was able to declare dividends aggregating over $400,000. Equally unique was its custom, never departed from, of suspending operations over Sunday.

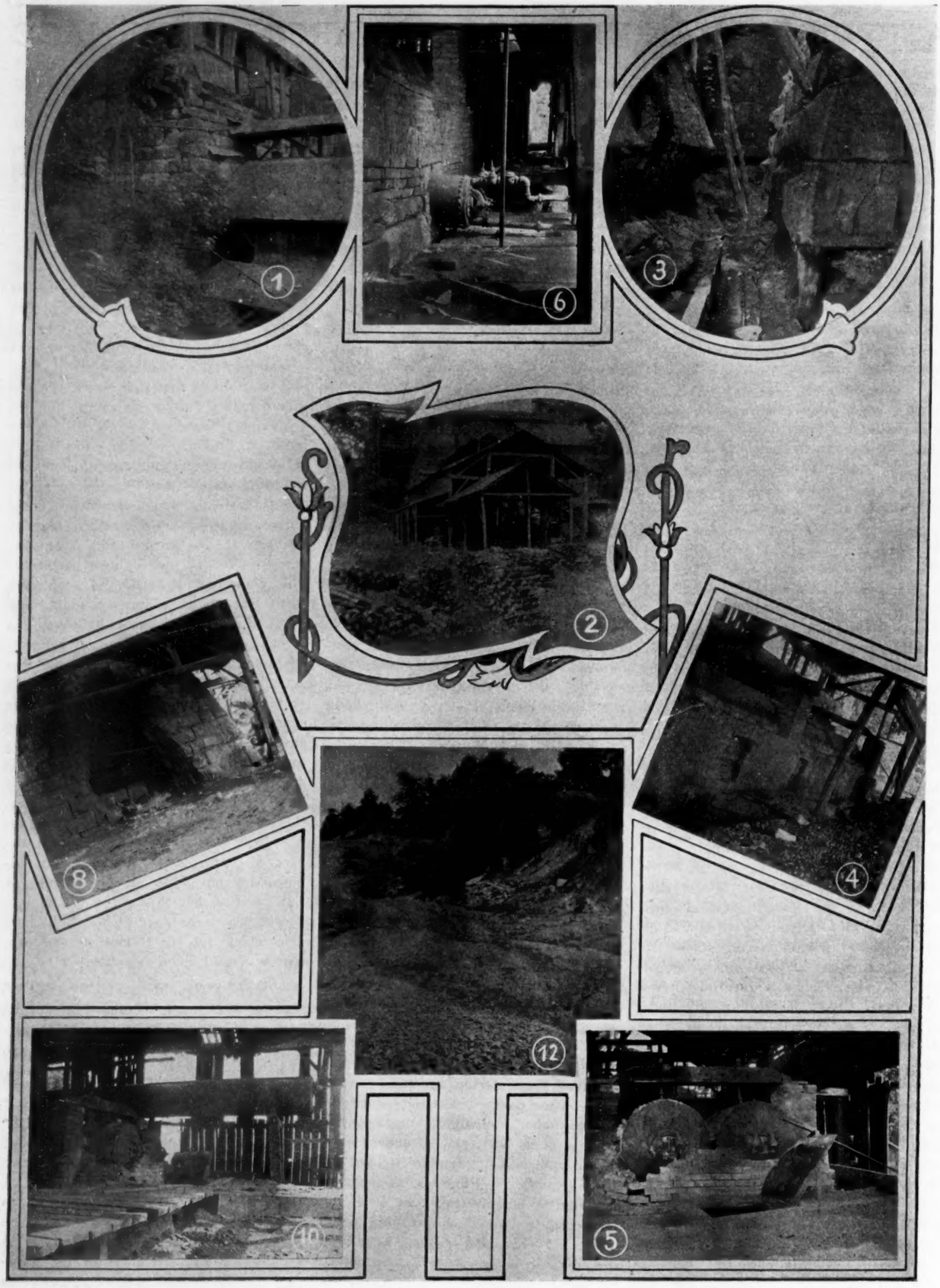
In appearance, Jefferson is not different from the other charcoal furnaces of that section. Its stack is square, each side measuring about 20 feet at the base, and is constructed of heavy sandstone blocks carefully hewn to shape. It is located on the side of a steep hill in a recession cut from the solid rock. The illustrations show the nature of its location and Fig. 3 gives an adequate idea of the manner in which the rock has been cut away to accommodate the stack, a corner of which, supported by a wooden post where the foundation has given away, is clearly shown. The inwall, during most of its operation, was built of fire brick. The hearth was of dressed stone, and it is interesting to note that when this was new two casts a day was the rule, but toward the end of the blast, when the hearth was badly worn, three casts were necessary. An entry in the day book of the company under date of March 7, 1861, records the payment to David Jenkins (mason) "By hewing hearth rock, $43, and by one day's extra work on same, $1.75." The furnace was arranged for two tuyeres, but ran with but one. It was a cold blast proposition during most of its history, the hot blast being provided at a comparatively recent date.

The hills surrounding the furnace were at one time covered with a heavy growth of timber suitable for the manufacture of charcoal, and no other fuel was ever employed in its operation. These coal pits, which were located in the clearings, were of various sizes, but followed the same general type. The wood, after being cut and corded, was arranged in a conical pile, over which a thin layer of leaves was placed to keep out the dirt, of which a 4-inch covering was provided. Down the center of this heap an opening of considerable size was left for convenience in starting the fire, and air openings were provided at various places around the base. After firing the pit the central opening was filled with billets, the top was closed over and about a week was required to complete the operation. With the cold blast, from 175 to 200 bushels of charcoal was required for each ton of iron produced. This was always measured, never weighed, and for convenience wagons were built with a capacity of 200 bushels. Charcoal sold at from $9 per load up to $20 per 200 bushels, the latter being the figure reached when iron was at its highest. The charcoal was forked into the furnace and the finer pieces, which slipped through the tines, were used to braze the ores piled on the hill near the furnace top. In this way, sulphur and considerable dirt were removed. When charcoal could not be conveniently had for this purpose, the practice was to braze with chips from the clearings. As the timber was cut off, much of the furnace lands was placed under cultivation and was gradually disposed of for that purpose. Efforts were made at one time to manufacture coke from the stone coal found on the furnace properties, but this plan proved a failure, although the coal was very satisfactory for other purposes.

The ores employed at the furnace were entirely from the adjacent hills, two views shown in connection with this article being taken at the top of what is known as Horeb hill, a large elevation close to the furnace from which an immense tonnage of ore has been mined. Some of these ores ran as high as 60 per cent in iron content, though others ran as low as 40 per cent. Ample supplies of limestone were found in the immediate vicinity. The usual plan was to operate the furnace nine months of the year, from June to March, the shutdown being occasioned by the fact that the supplies of charcoal and other materials were secured with difficulty during the winter months.

Jefferson furnace was built by the Jefferson Furnace Co., the stockholders of which were without exception Welsh. At the outset they made up their minds that they would rather not make iron than operate on Sunday, and so far as can be learned this rule was never broken in the slightest particular. The plan was to make a clean cast about 11 o'clock Saturday night and then burden the furnace lightly. The notch was then plugged up, all connecting pipes were closed, the furnace was sealed and everything was done to prevent the admission of air by which the charcoal could be burned out. For the ensuing 24 hours not a wheel was turned at the plant. At midnight Sunday, wood fires were lighted under the boilers, steam was gotten up, connections were made and the blast was applied. It was estimated that the furnace lost only about two hours in addition to the 24 of Sunday because of this practice, but this did not take into consideration the fact of the light burden, which did not resume normal proportions until noon Monday.

The materials yard of the furnace was a level area on the top of the hill, from which the handling of materials was a simple matter, inasmuch as no further elevation was required. The furnace top, or tunnel head, was covered with a hinged sheet iron plate, and sometimes blew up when the blast was excessive. This is clearly shown in Fig. 5. Another illustration, Fig. 4, shows a jib with scales attached, to which was suspended a box into which the ores were shoveled for filling. A smaller jib was provided for the handling of limestone. The furnace gases were diverted near the top of the stack to an opening beneath the boilers, also shown in Fig. 5, and provided ample heat for generating the moderate power



1. Side View of Stack, Showing Slope of Hill; 2, General View From Below, Cast House in Foreground; 3, Corner of Stack, Showing Sandstone of Hill Cut Away From Its Reception; 4, Boiler House and Jib for Weighing Ore in Filling; 5, Furnace Top, Closed With Hinged Sheet Iron Plate; 6, Mud Drum Beneath the Boilers; 8, View of Stack From Cast House, Showing Thickness of Walls; 10, General View of Charging Floor, Showing Boilers and Tank; 12, Showing Manner of Mining Native Ores.

required. The gases were then conducted through the hot blast, when that was installed. Fig. 10 shows the plate covering the furnace top, the ends of the boilers and the long tank above them. Fig. 7 is a view of the engine room, where the original equipment, installed in 1854, is still in place. In the foreground is shown the large blowing tubs from which the upright pipe leads to the stove. The pitman rod on the engine is of wood shod with iron straps. Fig. 6 shows the mud drum beneath the boilers, all water entering them through the upper pipe; the lower was used for the removal of mud, a serious problem at this plant.

The output of the Jefferson furnace was never more than 13 tons per day, and averaged about 10 tons. For shipment this was all hauled to Oak Hill, a distance of 1¼ miles over a hill of heavy grade. The iron was cast in small pigs, remarkably regular in shape. In the early days oxen were employed for all teaming, and some interesting entries on the company's day book are in this connection. Under date of June 12, 1860, occurs the following: "Bought of Henry Jones, three steers, $195. Gave our note for $100, including boot between two steers." The following year this entry occurs: "Gave our note to Joseph Horton for a yoke of cattle for H. Beverly, $85. Same day took a lien note from H. Beverly for the amount."

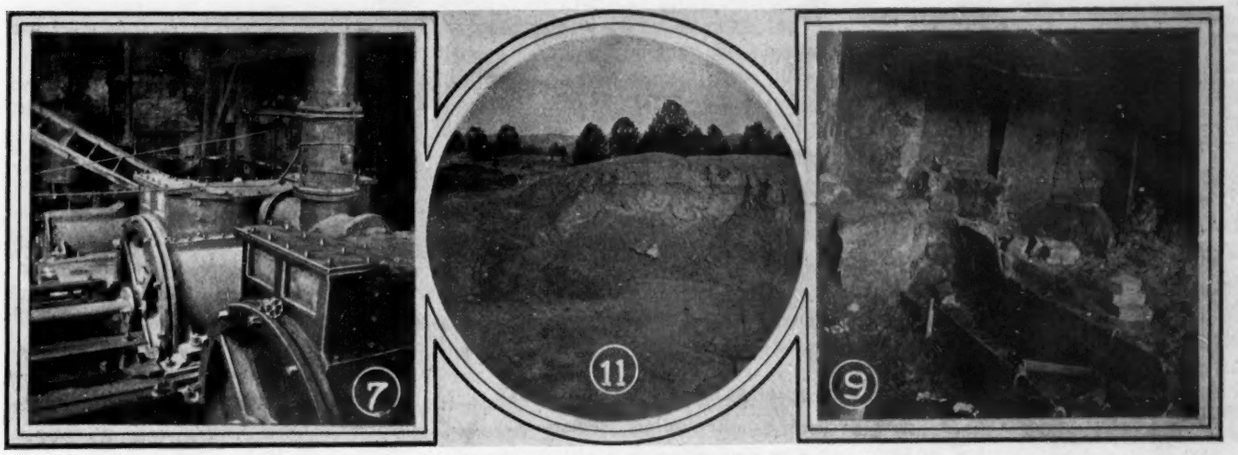
From the time it was built up to shortly after the beginning of the Civil war, Jefferson furnace had rather a difficult struggle for existence. Pig iron was only in fair demand, the price was low and money was so scarce that a cash offer would secure almost any price concession desired. The furnace books of about 1860 show many instances where payment for ore was made in pig iron, the prevailing rate of exchange being $2 per ton, and notes for long periods were issued for even paltry amounts. For a time commercial paper of this kind seems to have constituted the plant's chief output. Even when the outbreak of hostilities had brought about a more active demand for charcoal iron and frequent sales were recorded at steadily advancing prices, the matter of payment was still a perplexing one, as the record of almost every sale ended with some such statement as "Took note six months from date." The problem of short weight is by no means as modern as some furnacemen suppose, for an entry on the day book under date of June 28, 1860, runs as follows: "Sold to Honing, Pringle & Co., 30 and 2111 tons metal, $34, six months, $1,051.64. This iron was laying at Sandusky and counted to be 35 tons, but fell to the above amount as per city weigher's account. Took note six months from June 28."

If financial conditions were hard, however, supplies and labor were cheap. Cord wood was cut as low as 35 cents and 40 cents per cord was the prevailing rate until iron reached abnormal figures, when it advanced to 50 cents. Under date of March 21, 1862, occurs this entry: "Evan Crabtree. By 27 cords of wood, eight cords being at 40 cents, which pays his store account in full all but 6 cents; 19 cords at 30 cents cash, $5.70, less 6 cents as above." Bookkeeping methods in those days were rather flexible, as is evidenced by this entry of June 13, 1860: "M. Carroll. By 1,240 pounds of ore at $1.25, $0.67. He lost a mattock worth $1.25. Charge him only $1.22 to balance his account." Another entry credits one of the furnace employes who "returned a bedstead charged to him."

Salaries of the furnace officials ranged from $40 to $66.66 per month. An entry of Jan. 17, 1864, gives the expenses of the agent from Feb. 10, 1862, to date, as $663.49. The entry continues: "Amount drawed by him from the bank, $782.37, including $477 of former account, leaving him indebted to office of $119.08, which is charged to him on his pocketbook for next settlement." Frank Nicholas, who made a trip to the Cross Roads, several miles distant, in 1861, "to attach Graham's goods," charged 50 cents for his services. When work at the furnace was slack, the practice seems to have been to send out the employes to the aid of neighboring farmers, one of whom is charged in the fall of 1860, as follows: "To huskin corn by our boys, $34."

The furnace company acted as general banking agent for the community. It paid the supervisor's fees (for road work), charging same to the men's accounts, paid their taxes, made collections for the minister of the district, for the repair of the schoolhouse and the hiring of a teacher during the summer, raised a fund to buy a monument, and ran a boarding house at which separate meals could be had in 1860 at 8 cents each. The neighborhood was dependent upon the company store for every necessity of life which the surrounding country did not provide, and its livelihood was intimately connected with the success of the furnace.

Jefferson furnace was built with a capitalization of $34,500, there being 69 shares of $500 each. The largest individual holding was 11 shares and from



7, Blowing Tubs With Blast Pipe Leading to Stove; 9, Furnace Notch and Spout; 11, Views on Horeb Hill Adjacent to Furnace.

this the range was down to the fractions of a share, as the estates of the holders of a single share were divided. Up to about 1860, the low price of iron precluded any possibility of dividends, but in that year a number of sales were made at about $30 per ton and, as the notes received in return were taken up, a small initial dividend was made possible. Toward the close of the war, prices shot upward at an amazing rate and a golden flood poured into the company's treasury. In 1865 one lot of over 1,000 tons sold at $85 per ton, and there is a tradition that for one moderate tonnage an even $100 was secured. The low and high prices recorded on the company's books during these stirring times, together with the dividend declarations for the same years, are set forth in the following table:

Year.	Low. High.	Dividend.
1860	$27.00—32.00	$ 3,825
1861	24.00—32.00	.....
1862	27.00—31.50	6,900
1863	31.00—52.00	14.600
1864	52.00—75.00	27.600
1865	57.00—85.00	41,400
1866	61.50—68.00	20,700
1867	57.00—64.00	20,700
1868	54.00—57.00	6,900
1869	54.00—61.00	34,700
1870	52.00—56.00	69,000
1871	50.00—58.00	27.600
1872	58.00—60.00	69,000
1873	57.00—60.00	41,400
1874	53.00—61.00	27,600
1875	.....—50.00	.....
		$411,925

Following the business depression of the early seventies, no dividends were declared until 1879, when they were resumed and maintained for four years as follows:

1879	$ 6,900
1880	69,000
1881	48,300
1882	41,400
	$165,600

In 1887 they were again resumed, after a five-year lapse, and continued at a moderate rate until 1891. The furnace was then idle for a time, but some eight or ten years ago was acquired by new interests, known as the Jefferson Iron Co., by which it has since been operated. The last dividend declarations of the old company were as follows:

1887	$13,800
1888	19,200
1890	19,200
1891	6,900
	$59,100

In 30 years' time the little hillside stack had paid a total of $636,625, or slightly over $9,225 for each $500 share, which figures about 1,845 per cent. Two separate years, 1870 and 1872, the payment was $1,000 per share, or 200 per cent. As might have been expected, transfers of the stock were exceedingly few. In 1862, the company bought in three shares for $700 each and in 1888 secured five shares at $4,750 for the lot. The shares acquired in 1862 were later disposed of, but the block of five was held in the treasury and dividends thereafter were on 64 shares only. Under date of July 2, 1867, this entry occurs: "The following parties returned their receipts for United States 7.50 per cent bonds which they received from the company March 30, 1866, adding interest at 7.50 per cent on same. Aggregate, $13,372.54."

Among the purchasers of this iron half a century ago were the following: Barney, Smith & Co.; Fulton Foundry, Cleveland; C. & J. Cooper & Co., Mt. Vernon, O.; Jefferson Car Co.; Ohio Falls Car Works Co.; Barney, Parker & Co.; and the Louisville & Nashville railroad. Apparently it was in high favor with the car wheel makers. A considerable quantity of this iron was also used in the manufacture of large guns by the government during the war.

The difficulty of securing charcoal, coupled with the handicap of its small output and distance from a railroad, renders it doubtful whether Jefferson furnace will ever be operated again. Hewn in a smooth block of stone above the hearth is this inscription: "Jefferson Furnace, Thomas Jones, Agent, 1854."

PYROMETRY IN THE ANNEALING ROOM.

By H. S. Stupakoff.

(Continued from last issue.)

Recording Devices.

The equipment of all mechanical and electrical pyrometers includes necessarily a suitable indicating or recording device. That class of instruments mentioned as expansion and contraction pyrometers and thermometers have their mechanism for moving a pointer over a graduated dial directly connected to the operative portion of the end exposed to heat. The pointer of recording instruments of this type, which carries a writing pen or pencil, is connected likewise, and the latter bears permanently against a sheet of paper usually rotated by clockwork, and arranged either as daily or weekly records. The expansion and contraction of the substances which form the vital parts of these instruments furnishes ample power to admit a permanent contact of the writing pen with the paper without introducing material error. The result is therefore a continuous uninterrupted line which represents graphically the conditions of temperature with relation to time of the entire heating process.

In electrical pyrometers we have but a very small amount of power at our disposal for moving a pointer over a scale and for recording the corresponding temperatures. Resistance pyrometers are used in connection with a Wheatstone bridge to determine the change in resistance of its sensitive portion which is dependent upon its temperature. Millivoltmeters serve mostly, in thermo-electric pyrometers, for the measurement of the electro-motive force of the thermo-currents which in turn stand in certain relationship to the temperature prevailing at their points of junction. Radiation pyrometers which are also constructed upon the thermo-electric principle have the same means of measurement.

Recording instruments for these pyrometers embody the same electrical apparatus as their indicating instruments, and besides this a clock work with paper and style imprint movements. In recording instruments for resistance pyrometers, subsidiary currents from batteries or motors may be used for furnishing any amount of power that may be necessary for the pen, paper and imprinting movements. It is thus possible to produce uninterrupted continuous line diagrams on the record paper. In recording instruments for thermo-electric and radiation pyrometers, however, we are solely dependent upon the feeble thermo-electric currents for operating the movable portions of our galvanometers or millivoltmeters, and consequently we are compelled to rely upon these alone to produce permanent records in this class of instruments. This object can only be attained by resorting to periodic depressions of the style bearing the indicating needle. In this manner the records become line drawings that are composed of consecutive markings, which, according to the specific arrangement used, may combine either into a continuous line, or be represented by a series of dots which show continuity and dependency from each other in the completed diagram.

Advantages of Records.

The advantage of continuous autographic records, which give a truthful and lasting representation of all details accompanying the entire course of a process of heat treatment must be apparent. It furnishes the means to trace irregularities or negligence in the running and attendance of our furnaces and ovens, it serves to detect the causes of faults in the heat treatment of our materials that result invariably in unsatisfactory products, it suggests to us what steps are to be

taken to correct such faults and to improve the quality of our products and it makes it possible to systematize our entire methods of heat treatment, removing the responsibility from the overburdened shoulders of our expert operators. It makes us independent from them and allows us to place such responsibility without hazard and with far better chances for continued future success into the hands of green—though conscientious—common laborers. A series of records illustrating the heat treatment of our materials, intelligently marked with notations as to the physical qualities of the resulting products are unquestionably the best, if not the only means or the most reliable method for predetermining qualities that will be obtained under certain conditions. For establishing set rules as to the most economical, the most efficient, and the most reliable mode of running our various furnaces and ovens that will give us the best possible guarantee of definite results, and eventually for repeating previous processes which have proven satisfactory in imparting the resulting product with the most desirable good qualities.

This can not be readily attained by the use of an indicating instrument alone, unless its indications are noted down at regular short intervals by a trustworthy employe who has been especially detailed for this purpose. Non-recording instruments, however, are a necessity in the hands of men in charge of our furnaces or ovens. They will serve them as reliable guides and advisors that will furnish correct information of existing conditions, and they are their only means of reference as to what they are to do in order to strictly follow given instructions.

Uses of Pyrometers.

The principal use that pyrometers find in malleable cast iron foundries is for regulating the temperature of annealing ovens, and especially for regulating the temperature of the malleable castings themselves during the anneal.

It has been pointed out that large variations in temperature are apt to occur at different portions of an annealing oven. Such a state once existing, it remains practically constant, unless adequate means are provided to equalize the irregularities. It is but natural that the charge itself is subject to entirely different conditions. There is usually an enormous mass of cold material heaped up in the interior of the oven that is packed in suitable boxes, which are arranged in several rows two or three high; and such a mass can not possibly be heated uniformly by ordinary methods. Such portions of the charge as are most exposed to the direct action of the hot gases must necessarily absorb a larger quantity of heat than others that are less exposed. The lower and central portion of the charge is least accessible to the action of the current of hot gases, the flow of which is usually directed from one side wall to the other of the oven. This is what retards the anneal and determines its duration. The heating of this portion of the charge is almost exclusively effected by the slow processes of conduction and radiation. The upper portions of the annealing boxes and their contents, however, are easily overheated should the firing exceed the admissable limit. These are conditions which can not be entirely avoided in ovens of large dimensions, but much may be done towards reducing the time of anneal by reconstructing the ovens, by changing the method of charging the ovens, and by accommodating the practice of annealing to suit these ends.

In reviewing the situation it must occur to one that the selection of the place where a pyrometer should be introduced into an annealing oven, in order to obtain by its aid the most serviceable information as to prevailing conditions, is of considerable importance. We have seen that at best no more should be expected from a good pyrometer applied under such conditions than a reliably correct indication of the temperature of a single part or section of an oven. It serves therefore as a trustworthy guide that at no time the temperature may be allowed to fall below or rise above specified limits at this particular place. The regulation of the fires must remain with the attendant. He is relieved from the responsibility of using his own judgment and from guessing at existing temperatures. The pyrometer galvanometer or indicator is his heat gage, and the position of its pointer his guide which tells him when it is time to increase or decrease his fires, just as the pressure gage on a boiler reminds the stoker or fireman of his duty.

A far more radical method to ascertain and to follow the changes of the thermal conditions of an annealing process is to measure the temperature of the material itself. This may be connected at first with some difficulties, but it is by no means impractical. It is certainly the true way of proceeding if one would obtain positive results which may serve as a suitable basis to lay down iron clad rules for the allowable maximum limitations of our heating process. The writer is not aware that this has ever been attempted in malleable iron practice, but he had the opportunity to assist in developing some methods after this principle for the annealing of sheet steel. The results proved to be very satisfactory, and, in fact, it was found to be the only reliable means to produce superior brands of electrical steel, which could not be obtained by other means.

Application of Methods.

In applying such methods to the annealing of malleable iron it would suggest itself that the temperatures of the hottest and the coldest portions of the charge be followed up regularly. And as we should be informed of the respective temperatures of the malleable iron castings themselves, our measurements should be taken at the interior of the annealing boxes. This can not be done unless a few—say two or three—boxes of each charge are specially fitted up for the purpose. The arrangement does not require anything to elaborate. A suitable rigging would be an iron or steel tube half as long as the width of an annealing box, secured to its interior opposite a corresponding opening left in its side, of which it forms a continuation, extending inwardly like a thimble. The inner end of this tube must be closed, and the outer one may be provided with a flange which can be held in place against the inside wall of the annealing box by a wedge that fits between ribs, arranged for the purpose. The joint between box and flange of the thimble is luted with fire clay to prevent air and gases of combustion from entering. These test boxes are arranged in such a manner that the described thimble-like tubes stand in alignment with observation holes left in the walls of the annealing oven. The thimbles themselves are arranged as nearly as possible in a horizontal position for all types of pyrometers excepting for those constructed after the radiation principle, when they should incline upwardly with their inner closed end, so that a line drawn from here through the observation hole of the furnace wall will fall with its outer end about five or six inches lower.

The rest is easy. Any suitable form of pyrometer is introduced with the necessary precaution into the interior of these boxes, or the telescope of a radiation pyrometer is focused to the bottom of the thimble, and the indica-

tions received will be the temperatures that prevail at these particular places, and not those of the furnace or of the surrounding furnace gases. It would seem that this or some similar method is the only correct way to ascertain the temperature of the castings themselves.

The above dwells especially and specifically on the application of pyrometers in annealing practice, and apparently with good reason, as it is in this particular process where these instruments undoubtedly find the most extended use, and it is here where they should prove of the greatest value if properly applied. But aside from this there represent themselves many opportunities to make good use of them at other places in a malleable iron foundry. It is not the intention to enter here into the details of such varied applications, as each of these furnishes ample material for subsequent papers which can not be taken up at the present time. Suffice it to say that pyrometers can be also applied to excellent advantage for the regulation of melting furnaces, for the examination and most advantageous distribution of checker works in open-hearth or regenerator furnaces, for flues and stacks, for the melting and pouring of iron, as well as in core ovens and in the laboratory of the chemist.

We make a clear distinction between these two intimately related heating processes, for it is well understood that the temperature of the furnace does not represent the temperature of its contents. There may be wide variations between both, and again, they may approach each other very closely. It is neither at all likely that the temperature in an annealing oven is uniform throughout, though in some exceptional good instances—as in pit furnaces—there may exist no greater variations than 50 degrees Fahr. in its various portions. This, however, is a rare occurrence, it is found more frequently that different portions of the same oven vary from 100 to 300 degrees Fahr. and upward. It is quite feasible that under such conditions no satisfactory results can be obtained in the product, in which uniformity is one of the principal requirements. This is the first application in which we can make good use of our pyrometers for equalizing the temperatures in our ovens as closely as may be. Prevailing conditions are reliably indicated by applying one or more pyrometers at different portions of the installation, and such conditions being once established and known, it becomes an easy matter in the hands of a practical furnace man to regulate his own temperatures by enlarging some of the flues or by chocking others, by opening or closing dampers, by increasing or decreasing the supply of fuel or air or the draft in the stack, by luting up cracks in the walls or around the doors, and in other ways for which no set rules can be given, but which will readily suggest themselves in practice.

Errors in Readings.

In connection with the above it may be appropriate to call attention to a mistake which is frequently made when pyrometer readings are taken of furnaces of this or any other description. That is, such readings are usually taken for granted as representing the true temperature of the furnace, regardless of the fact whether the flame of the fuel plies against the sensitive portion of the instrument or not. This is wrong, and apt to lead to grave errors. We would expose our pyrometer to the direct action of the flame if it should be our intention to ascertain the temperature of this, but we must guard it against its direct influence if we wish to establish the state of the interior of our furnace. And, as it takes rarely more than a fraction of a minute to take such a reading, it will prove safest to turn off our fires while making tests of this nature.

We know that it takes a long time before our annealing boxes and their entire contents "come up" to the heat of the oven. The oven may have had the right temperature many hours before even the most exposed portions of the boxes approach the same. In uniformly working ovens after a sufficient lapse of time, and by judicious firing, we succeed in bringing both to the same temperature, but if we wish to prevent any portion of our anneal from overheating we are compelled to keep on firing at a slow rate and at a low heat.

The best method of annealing consists in heating the charged material as quickly as possible to the maximum temperature compatible with the process, to keep it at this stage for a sufficient length of time to effect the desired molecular change and then letting it cool down slowly.

A considerable saving in time and in fuel may be effected by pushing the firing in the first stages to its upper limit, provided due care is being taken to make full use of the heat derived from the combustion of the fuel for heating the charge, and not sending it out of the stack. This object is rarely attained in the fullest measure. It can only be accomplished by causing complete combustion of the fuel either outside of the oven or at least before the unburnt gases have had a chance to come in contact with the large quantity of cold material that is massed up in its interior. It is surprising to learn how little economy is exercised in the use of fuel in ordinary annealing practice, or to put it more plainly, how much fuel is recklessly wasted. No knowledge of the higher mathematics is necessary, only a little plain arithmetic to show the percentage of the developed heat effectively used and that of the heat lost. This is a question worth looking into. It is dollars and cents to the manufacturer.

It is true, such problems can not be solved within a day, and perhaps not in a week, but they are not beyond satisfactory solution. It is also acknowledged that the "mere possession" of the best of all necessary instruments for checking and regulating thermal process is not sufficient. It requires their intelligent and correct application, and a fair understanding of the construction, and value of their indications.

The best service in this direction can be expected only from a trained metallurgical engineer who must be at the same time an experienced specialist in combustion and in the heat treatment of materials. However, much is to be gained without the valuable aid of such an advisor, by the intelligent application of the various excellent instruments now obtainable for the purpose, such as draft gages, gas analysis apparatus and pyrometers. Quite frequently a single one of these instruments may render material aid in improving existing conditions; as the draft, the composition of the gases of combustion and its temperature are closely related to and dependent upon each other. And as most practical men—by which I mean especially the manufacturers — are averse to equipping their works with a variety of physical apparatus, they may be satisfied as a rule with the results obtained from the use of a reliable pyrometer.

It should require but little argument to convince the user that the same equipment or the same fittings of a pyrometer are rarely suitable for temperature measurements of metallurgical processes that are of different nature or which are conducted in furnaces of different construction or design. The variety of their applications, to which reference has been

made in the foregoing, should present sufficient reasons why it is impossible to devise a single universal form that would prove equally convenient and equally serviceable under all conditions. And as the success to be derived from the use of these instruments depends largely upon their form, their fittings and their equipment, which must be specially adapted to the particular use for which they are intended, it is always advisable to leave the selection of the apparatus in the hands of a specialist in such matters.

There are many people who expect that after they have spent hundreds of dollars for a new wrinkle, of which they have heard that it served others to obtain the desired ends, their old troubles and difficulties should be overcome even before the package has been delivered. That is unreasonable. Physical instruments perform no magic. Chronic ills can not be cured in a day, intricate problems can not be solved without intent study and without intelligent application of our faculties, results can not be obtained without effort, and a frail system can not be built up without patient nursing. There is no easy street to success; it is strewn with many obstacles which prompt the timid to turn back, and which are surmountable only by a few selected ones, who are possessed of enduring strength and of indomitable will. Such men are ordained to become the true captains of our industries.

Patience in Acquiring Familiarity.

This is not mere phraseology, but it has direct reference to the application and care of pyrometers and other similar physical instruments which have found a way into our manufacturing establishments. They are of necessity mostly of a delicate nature, and their judicious handling and proper treatment must be learned before they can be mastered. It can not be expected that they should prove of immediate success in the hands of a novice, nor that their application should bring marvelous results the first day. They are a decided deviation from other tools and appliances used in our factories. This explains why the necessary skill of safely handling them is occasionally acquired at the expense of some unfortunate breakages, which, however, are caused almost without exception by overcarefulness and consequent awkwardness. Such minor difficulties, if they should happen, must not discourage the user. They will soon be overcome after the use of the apparatus has become common practice. The instruments are certainly no more delicate than a watch, or a glass tumbler or a china cup, and nobody will give it a thought of breaking them after they become as much used to them as they are to these.

A decided turn is reached after the first superior results have been obtained; after that there will be no going backward, no trusting to the good luck of the workingmen to run furnaces and ovens without them. That is the time when it will be acknowledged that the pyrometer has come to stay.

The introduction of these and other physical instruments into our manufacturing establishments is not a mere fad or fancy, or a whimsical trend of modern times which must be lived up to in order to keep up with the fashion. It is nothing of the kind. It is a decided step forward, a means for the advancement of the arts, for the perfection of old methods, for improving the quality and enhancing the value of our products of manufacture, for predetermining results, for repeating previous successful metallurgical operations and thereby preventing failures and irreparable losses.

Let physical appliances be looked at in their true light, exclude all false misleading illumination, put them on the scale of a delicate balance in opposition to results, and their value will become more readily understood, their service will be appreciated. They will then be considered as absolute a necessity as the pressure gage on the boiler, as the chronometer and the sextant on a seafaring vessel and as the time piece in our daily life. Their present extended applications have furnished many convincing proofs of their usefulness, and while today they are an acknowledged factor in the intelligent conductance of metallurgical operations, the period is rapidly approaching when they will be considered as indispensable in malleable foundries as the shovel and the rammer in the hands of the molder.

A MACHINE OF NEW DESIGN FOR HARDNESS TEST[1]

By Thorsten Y. Olsen.

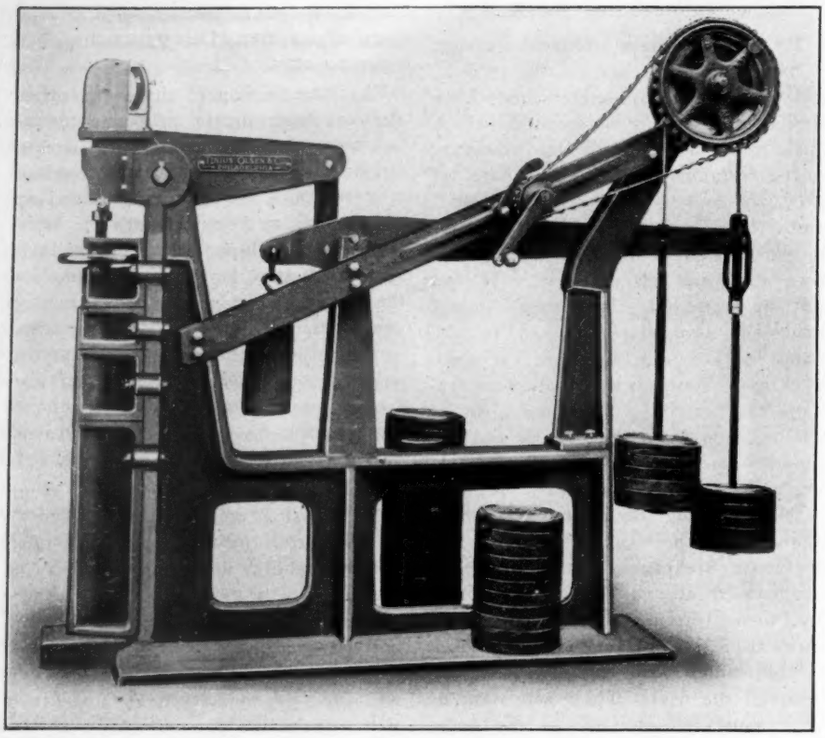
The hardness test for iron, steel and other metals has been greatly used in research work; in the development of high grade tool steel; in determining effects of various processes of case hardening, etc.

The test has at the present time stepped beyond the field covered by the research laboratory and is demanded for determining the proper material, from the machining and finishing point of view, for maintaining a constant and uniform hardness in gearing, such as is used in automobiles; for determining uniformity of wheel tires, so that two tires of the same hardness may be selected and placed on the same axle to secure uniform wear; and a number of other practical applications of a similar nature can readily be cited. Such tests must be made accurately, quickly, and the machine must be of such construction that it can be operated by the ordinary shop mechanic and the personal equation be eliminated from the test.

For determining hardness there is no better method than the penetration of a standard steel ball under a certain pressure, noting the deformation produced. The difficulty with this method has been the lack of a practical form of machine, one constructed so as to admit of its use in every-day shop practice. The machine I am about to describe was designed at the request of Mr. Vauclain, of the Baldwin Locomotive Works, for testing locomotive tires as well as any other material entering into the construction of a locomotive. The construction of the machine is shown very clearly by the illustration and consists of two levers mounted on a frame and having a combined count of 100. The load is applied by weights at the end of the one lever which causes the penetration of the steel ball at the end of the other, the specimen being placed between the steel ball and the frame of the machine. The penetration is measured automatically to a ten-thousandth part of an inch by the instrument as shown on the top of the main lever. The method used in applying the load, and a number of other details, are of special interest and I will explain them briefly in stating the directions for making a test on the machine.

The gap for inserting the test piece

[1]Presented at the Atlantic City meeting of the American Society for Testing Materials.



NEW HARDNESS TESTING MACHINE.

is first set to suit the thickness of the specimen and the crank turned to raise the secondary lever to its highest point, thereby raising the ball and instrument within the hood shown, and which acts to protect those parts while inserting the test specimen and also as an abutment against which the specimen is clamped. With the specimen in place an initial load of 10 or 20 pounds as may be desired is placed upon it by turning the hand crank and thus lowering the lever until it comes to rest. With the initial load on the specimen the pointer of the instrument is set to zero by turning a knurled head until it comes to rest, after which the load may be applied.

The amount of pressure to be applied is kept a constant for any certain material and the equivalent in weights is placed on the bail suspended from the clevis having the elongated slot in which the lever acts and is applied to the lever by still further turning the hand crank and lowering the weights until they are suspended from the pivot of the lever. The weights which apply the load to the lever are counterbalanced by the other weights shown so that all the work the operator has to do is in lifting these counterbalance weights the length of time, a fraction of a second, that it takes to make the penetration. A ratchet and pawl hold the raised counterbalance weights in position until the operator reads the penetration on the dial. The weights are then released, the lever raised to the top position again and the specimen removed and the machine is then ready for the next test. To make a sample test in this machine takes less than a minute, including the time required for inserting and removing the test specimen. The instrument is entirely encased and all small parts thoroughly protected so no damage can occur in ordinary usage.

Applying the load through a balanced lever system is the most accurate method, as it is not subjected to variation and can be verified at any time. The instrument can also be very readily verified, so the machine as a whole is as accurate as can be made. To illustrate its accuracy a piece of high carbon steel bar made especially uniform through an annealing process was tested in spots along its length varying by 500-pound increments up to 10,000 pounds, and the consequent indentations noted were very uniform. Successive increments of 500-pounds load up to 10,000 pounds were again applied to the same spot without disturbing the instrument or specimen and the increments of indentations were again found to be very uniform and the final indentation in each case was the same. This machine adapts itself to the greatest range of specimens, as over 500 degrees of hardness may be noted for each variation of load.

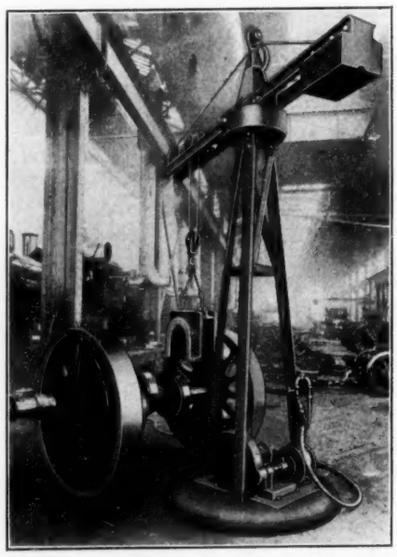
The proper load to use for various materials, which must be governed to a certain extent by experiment, are as follows:

Babbitts, 500 to 1,000 pounds.
Bronzes, 2,000 pounds.
Cast iron, 3,000 pounds.
Steel, 5,000 pounds.
Special test, 5,000 to 10,000 pounds.

A NEW PORTABLE JIB CRANE.

The portable jib crane described herewith was designed by a master mechanic on one of the largest railroads in the country and has been successfully tried out in the erecting shop.

It may be placed in any position on the floor by overhead traveler in a moment's time and will handle loads without any manner of assistance from traveler. Thus not only is the labor of the men engaged on a given job rendered more efficient, but the time of the traveling crane is effectually conserved, and on account of its flexibility of location, a crane of this type should be popular in many lines of shop work. The work handled by this crane in railroad shops, for instance, includes the removal of driving boxes, eccentric straps and eccentrics from driving axles and, after repairs have been made, of refitting these parts to the axles. All work in connection, such as putting up the cellars, sponging boxes and bolting the eccentrics and eccentric straps is done under the crane and driving wheels are ready to place under engine. It is said that one of these cranes will serve a shop handling 60 engines a month for average repairs,



WHITING FOUNDRY EQUIPMENT CO.'S PORTABLE CRANE.

and from actual experience will save the labor of one mechanic and two helpers, amounting to about $200 per month. Besides this economy, much of the time of the traveling crane is available for other operations, which could not be performed by one auxiliary crane, thus greatly increasing the commercial efficiency of the more expensive tool.

This portable crane can also be used advantageously in a locomotive boiler shop and for handling the pneumatic gap riveter or staybolt breaker, in machine shop for assembling tools and for handling heavy vise work. In almost every shop there are fitting and assembling operations on the floor which call for crane service, and in the absence of some such device as that shown the traveler must be called on, with probable consequent delay to other operations.

The crane consists of a heavy base plate and structural pillar attached thereto and having a swivel plate on top of which a rotating jib stayed by tension rods is pivoted. A movable trolley is provided which supports a block and hook, and a weight attached to opposite end of jib balances the trolley and part of the load. At the head of the pillar is fitted an eye bolt and shackle for handling by the overhead traveler.

The hoisting gearing is attached to the base plate or structural pillar and is operated by pneumatic or electric motor or hand power. The swinging and trolley travel are operated by hand power. Capacities range from 1,000 pounds to two tons, with effective radius of about 10 feet.

These cranes are manufactured by the Whiting Foundry Equipment Co., Harvey, Ill., in capacities of from one thousand to four thousand pounds.

OPPORTUNITIES FOR ELECTRICAL ENGINEERS IN SOUTH AMERICA.

Argentine Republic.

Consul-General R. M. Bartleman, of Buenos Aires, reports as follows concerning the opportunities in the Argentine Republic for the employment of American Electrical Engineers:

In the installation of tramways, city lighting plants, telephones, etc., the standard of the practicing electrical engineer in this country is a high one. Installations of the higher order of engineering such as first class elevators, motors in modern offices and hotels, etc., are in their infancy.

There certainly is an opening for first-class electrical engineers, as well as structural engineers, and they will be successful if they conform with the customs of the country to a certain extent, but they must remember that electrical and other engineers in Argentina are paid fully 20 per cent less than the usual pay of engineers in New York.

At the present time there are a number of important and large modern buildings, and others not so costly, to be constructed in Buenos Aires. As an example, the Plaza Hotel, when completed, will cost over $2,500,000. The government contemplates large port improvements, and the railroads are about to construct large stations. The latter will be in English hands, however, as they are controlled by English capital, and therefore English mechanics and engineers will be preferred.

The principal difficulty to be encountered by American engineers in getting a foothold in the important construction lies in the fact that these constructions are almost wholly financed by English, German or French capital, and naturally the important posts fall to the engineers of the countries furnishing the capital. This does not mean that there is no room for American engineers, whose training and methods of work are acknowledged to be the best in the world. Already the matter of building construction after the styles and methods employed in the United States have received good impetus in two or more buildings, now nearly completed, which have been erected after the designs and methods used in the United States, the structural steel and ornamental work having been furnished and erected by American firms.

Uruguay.

Consul Frederick W. Goding, of Montevideo, reports as follows concerning electric systems and plants in Ururguay and the opportunity for American electrical supplies and engineers:

There are three tram systems in Montevideo, two having electricity for motive power, viz: Sociedad Comercial and Sociedad Transatlantica, and one, Tramvia y Ferrocarril del Norte (horse traction within the city and steam beyond), owned partly by the Uruguayan government and partly by private parties.

In Montevideo there are about 15 electric-light plants and several small power plants used in printing establishments. In the outskirts there are several electric light plants, not used in the winter, while there are small electric light plants in half a dozen cities in the interior, and about 15 connected with slaughtering establishments.

The immense plant used in supplying light to Montevideo, owned by the Uruguayan government, has recently been very much enlarged, so that now the power generated is sufficient for lighting the city and suburbs, including private lighting, besides furnishing power to all those now using private plants. As the price of the current on January 1, 1909, was reduced from about 26 cents American to 12½ cents per kilowatt hour, the small plants may go out of use. In the country districts the prices vary from 21 to nearly 26 cents per kilowatt hour.

Electric Engineering and Government Policy.

The chief electrical engineer of the government, an Italian, who is under contract for a term of years and whose position will ultimately be filled by an Uruguayan, receives $620 per month; the resident engineer for the Sociedad Comercial, a Canadian, receives about $350, and the chief engineer for the Sociedad Transatlantica about the same. All the other positions are filled by Uruguayans, with salaries ranging from $50 to $80 per month.

The policy of the Uruguayan government is to send young men to Europe to be trained for electrical engineering, who, on returning to this country, are placed in government positions. Hence, the opportunities for young men from the United States are limited to times when new works are being erected, as only then are skilled foreigners employes. Such positions have been available, but are now closed, as the new works are practically completed. It is the intention to change the horse tram line to an electric system, and the port authorities eventually will erect electric cranes and install an electric-light service along the wharves, notice of which will be sent at the proper time.

The general use of electricity as a motive power, as promised by the enlargement of the government plant and the great reduction in the price of current, will lead to the sale of a large number of electric motors and a vast quantity of electrical supplies. In such a field there appears to be an opportunity for the establishment of supply houses through which a large and permanent business may be built up. It is in that direction that the efforts of electrical engineers from the United States will be most successful.

The Northwest Bridge Works, Portland, Ore., is constructing a steel traveler for the Wind River Lumber Co. The track of the traveler will be 1,700 feet long. This company is also furnishing a steel bridge, 100-foot span, for the Mount Hood road.

IMPROVEMENT IN MINING METHODS AT CORNWALL MINE

Owing to the increasing depth at the Cornwall Mine of the Cornwall Ore Bank Co., Lebanon, Pa., the steep track grades, and in order to reduce mining costs, it seemed wise to consider a new system of operation and to build such a plant as would best meet the required conditions.

It was decided to build a double skip incline on the foot wall side of the mine, at the bottom of which should be located a pit pocket (See Fig. 1) capable of taking the largest lumps that a 70-ton steam shovel would handle, and to crush with a large jaw crusher in order to make the handling of the lumps less destructive to the bins, feeders and skips.

At the top of the incline the roll crusher and screening plant is located, from which the crushed ore is to be taken in a transfer car across a steel viaduct to the loading pockets which are located between the tracks of the two railroads serving the mine.

It is intended to work the mine in 30-foot benches, picking up with the steam shovels and placing into 50-ton self-cleaning and side-dumping mine cars, with mechanically operated gates, the cars being shifted with steam locomotives to the dumping place over the pit pocket. Special provisions are made for handling large lumps of ore and getting these to the 60 x 42-inch crusher with the minimum difficulty, a Mason roller 9 feet in diameter being used to feed the crusher. Small bins are placed between the various steps in the operation to provide leeway and insure as far as possible continuous operation.

After passing the crusher, set at 16 inches, the crushed material rejoins the stream which has been roughly separated by means of a space back of the feed roller, in a 100-ton double roller pocket which feeds either skip car.

The whole structure of the pit pocket, 70 feet high, is entirely self-contained, and can be slid down the foot wall as the depth of the mine increases.

The crusher was designed by E. C. Bacon and built by the Farrel Foundry & Machine Co., the important parts being steel castings of very generous dimensions. A 150-horsepower motor drives the crusher.

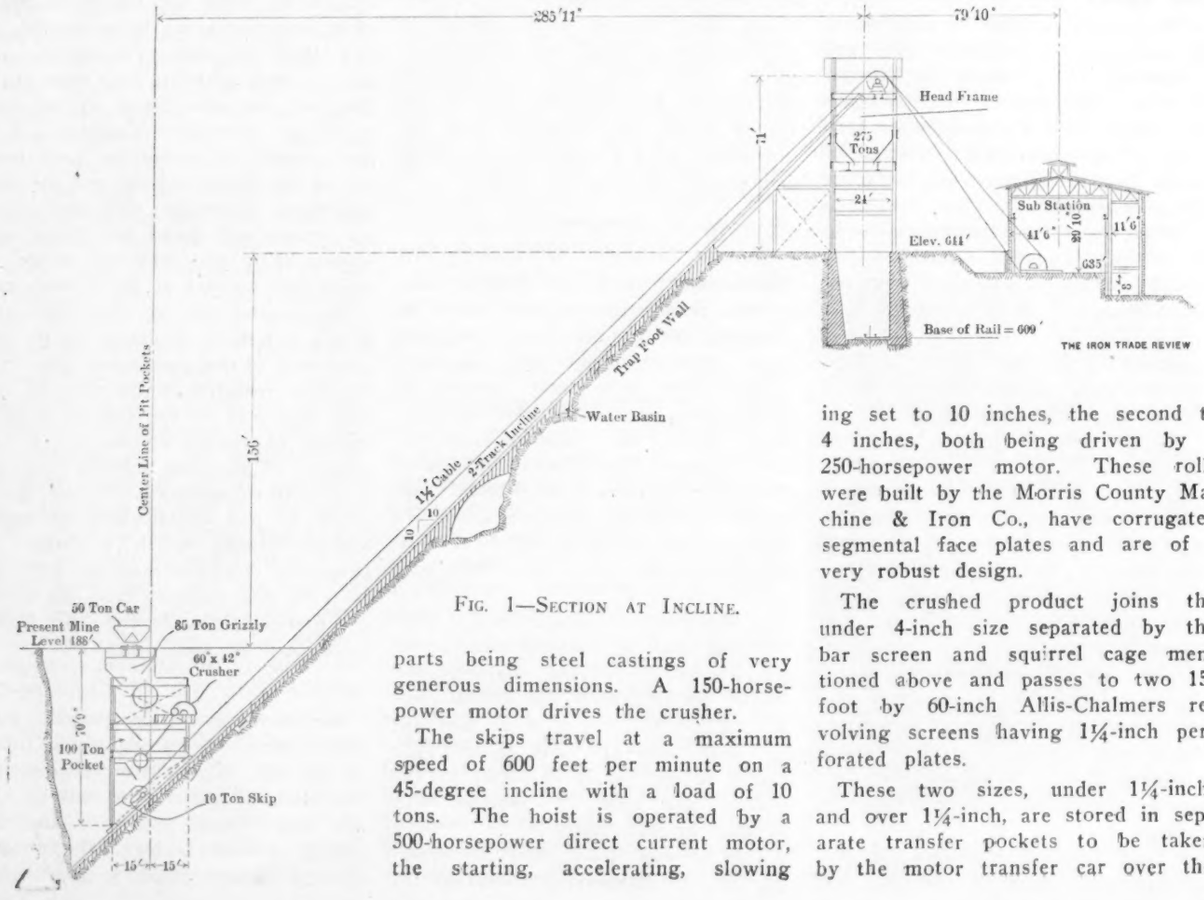


FIG. 1—SECTION AT INCLINE.

The skips travel at a maximum speed of 600 feet per minute on a 45-degree incline with a load of 10 tons. The hoist is operated by a 500-horsepower direct current motor, the starting, accelerating, slowing down and stopping being accomplished by automatic electric control. The skip will be arranged for hoisting water in flood times. As long as the mine foot wall continues at 45 degrees, the skips will be run balanced; but when the slope changes to 30 degrees, as will be the case after several years, another 500-horsepower motor will be added to the hoist and the operation continued unbalanced.

The hoist was built by the Lidgerwood Mfg. Co., and is equipped with double drums 108 inches in diameter and 52-inch face grooved for 1½-inch diameter wire rope. Two posts brakes are provided to hold in both directions. The brakes are geared and have wheels 54 inches in diameter by 12-inch face and are operated by compressed air.

The skips dump on a head frame, 60 feet above the ground level (Fig. 2), into a 175-ton bin which has at its outlet a Mason squirrel cage roll feeder and another step bar screen, all to pass 4-inch lumps. The over size is crushed in two sets of 48 x 48-inch corrugated rolls, the first being set to 10 inches, the second to 4 inches, both being driven by a 250-horsepower motor. These rolls were built by the Morris County Machine & Iron Co., have corrugated segmental face plates and are of a very robust design.

The crushed product joins the under 4-inch size separated by the bar screen and squirrel cage mentioned above and passes to two 15-foot by 60-inch Allis-Chalmers revolving screens having 1¼-inch perforated plates.

These two sizes, under 1¼-inch, and over 1¼-inch, are stored in separate transfer pockets to be taken by the motor transfer car over the

steel viaduct to the loading pockets where it is stored ready for railroad shipment.

The loading pocket (Fig. 3) is a concrete structure having a capacity of about 2,500 tons of crushed ore; the shipping track passes under and through the bin arches, the cars being loaded by means of Mason rollers, not over two minutes being required for the loading of one car and several cars being loaded at once.

Extending back from the bin is an elevated trestle 40 feet high, from which can be stored 30,000 to 35,000 tons of crushed ore, which can be reclaimed by a steam shovel or a grab-bucket crane operated from a railroad track. (See Fig. 4.)

The power for the operation of this plant is generated at Lebanon by three 22 x 33-inch twin tandem Westinghouse gas engines direct connected to 750-kilowatt, 440-volt, three-phase, alternators. These engines operate on coke oven gas which is to be piped from the ovens of the Lackawanna Iron & Steel Co. and the Pennsylvania Steel Co., through an "oxide" sulphur purifier, a recording meter, and into a 250,000-cubic-foot gas holder from which it is drawn as needed by the engines. The 440-volt current is passed through step-up transformers to a transmission voltage of 11,000 volts and is wired along the Cornwall Railroad and Cornwall & Lebanon Railroad tracks to the mines, entering the sub-station on the hill side where it is stepped down to 440 volts for use in the alternating current motors. For use in direct current work there is provided a 500-kilowatt rotary converter which will supply a 500-volt direct current.

In comparing the old system with the new, the following differences are to be noted:

1. No ore is to be taken out of the mines with locomotives, thereby avoiding grade trackage and excessive repair costs.

2. Delays on account of shifting should be minimized, as all cars are of 50 tons capacity and the operation is continuous.

3. The ore will be thoroughly mixed after passing the various machines and bins, including the storage bins.

4. The ore will be broken, ready for roasting.

5. The ore will be sized so that it can be mixed in the proper proportions for most efficient roasting.

6. Railroad cars will not be delayed in loading, and trips to the mines increased to one per car per day.

7. Railroad cars will not be damaged by mine handling.

8. It may be possible to operate the mine five days per week, instead of six.

9. The number of men required will be lessened.

Finally, the present method cannot be continued for more than 1,000,000 to 1,500,000 tons, owing to the grades, etc. Excess power can be sold to various consumers at a considerable profit, as its cost at the switchboard should not exceed 5 to 6 mills per kilowatt hour.

The engineering work, in general plan, was laid out by A. J. Mason, of Hoover & Mason, Chicago; the electrical apparatus was furnished by the Westinghouse Electric & Mfg. Co.; and the details, both of designing and construction, were carried out by the company's own engineers

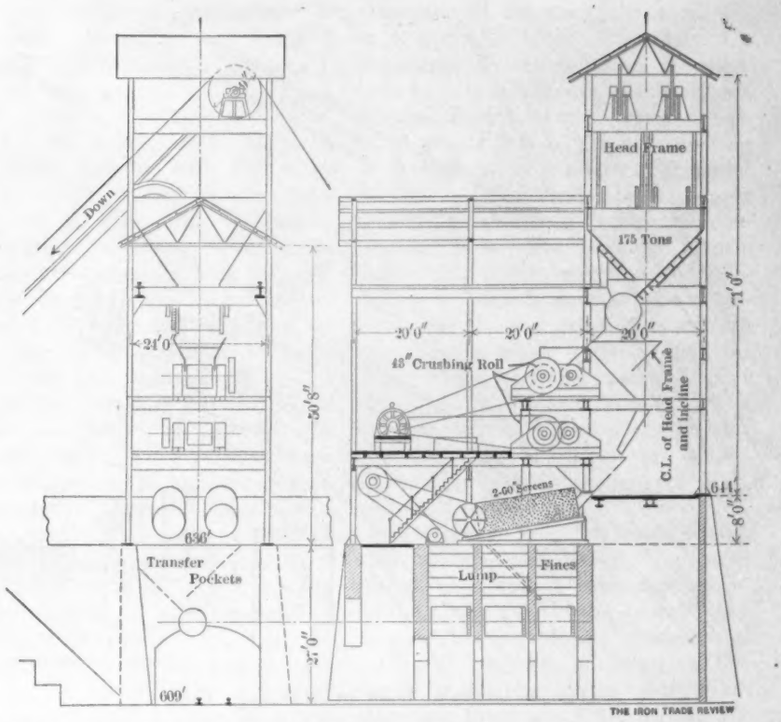
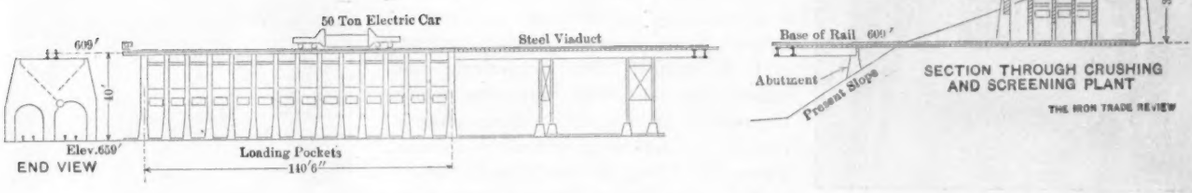


FIG. 2—END VIEW AND SECTION THROUGH CRUSHING AND SCREENING PLANT.



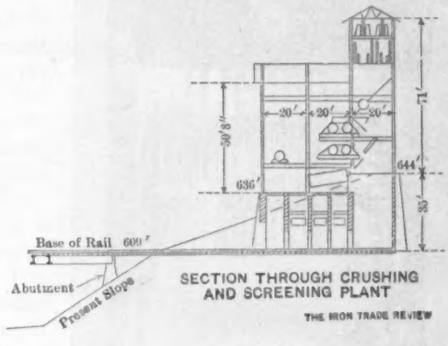


FIG. 3—ELEVATION OF TRANSFER AND LOADING SYSTEMS.

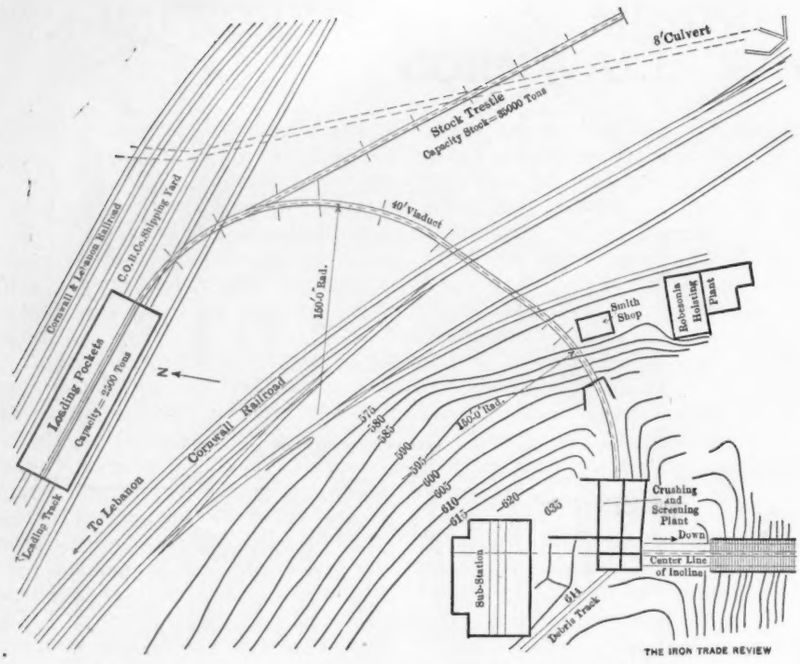


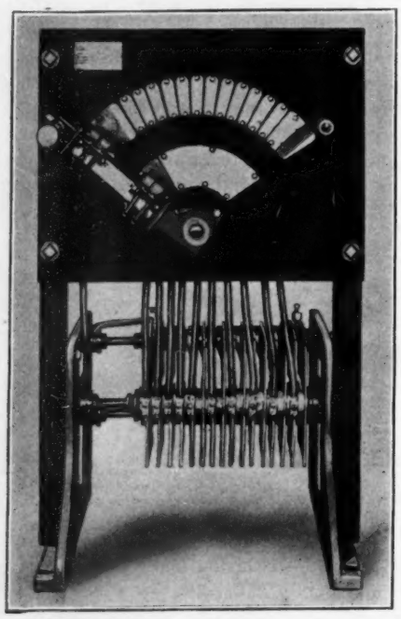
FIG. 4—GENERAL PLAN OF HANDLING PLANT.

on the ground. The whole plant is expected to be in operation during the latter part of the present summer or early fall.

NEW LINE OF MOTOR STARTERS.

The Electric Controller & Mfg. Co., of Cleveland, O., has developed and placed on the market a new line of starters which are essentially of mill type design and rugged construction.

In designing these motor starters the company says it has attempted to interpret severe operating conditions, and that this has necessarily led to the use of some features not found in any existing motor starter. Mill type motor starters are made in panels, have supporting feet, and are completely self-contained. The dimensions of the different forms vary only in height. In width, nothing projects beyond the slates, so that adjacent starters may be placed side by side, forming a continuous control board. The starters are furnished in several forms, beginning with a very simple form and elaborated on to embrace such features as no-voltage release, overload protection for running, and separate and different overload protection for accelerating. In explanation of the last named feature, this design allows more current to flow through the motor during starting than during running. If a motor is connected to a load having large inertia—such as a hot saw or a press with a heavy flywheel—the mere accelerating of the load demands a very considerable expenditure of work. Since this starting is relatively infrequent, the motor will not be injured by employing a starting current in excess of the running current, yet the starting current time will be materially reduced. There are, in fact, numerous instances where it is desirable to allow an accelerating current larger than the running current.

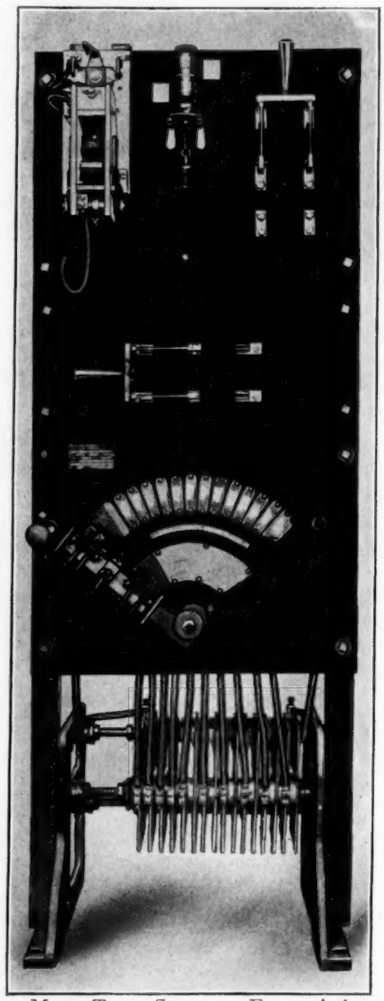


MILL TYPE STARTER, FORM F-1.

It is claimed that experience has shown that no-voltage protection which is secured by a spring return arm, is open to the following serious objections: First, the spring is likely to be either broken or weakened so that upon voltage failure the arm does not return to the off position. Second, the contacts may become so roughened that the spring is not powerful enough to move the arm. Third, an ignorant operator may block the arm in the off position, so that it is impossible for the spring to properly perform its function.

If, through any cause, the arm is not returned to the off position upon voltage failure, the motor will necessarily be subjected to a damaging overload upon the return of voltage. In the mill type motor starters the danger of a broken or weakened arm spring is absent, because no such spring is used. The no-voltage protection is secured entirely by a magnetic switch which opens upon the failure of votlage This same magnetic switch in connection with an overload coil is used for securing overload protection. Since the overload feature must stand the abuse and have the characteristics of a circuit breaker, the Electric Controller & Mfg. Co. believes that it should possess the advantages and arc breaking ability of a circuit breaker.

The following valuable features summarize the operation of this type of motor starter:



MILL TYPE STARTER, FORM A-4.

First. The magnetic switch can be closed only by bringing the arm to the off position, preventing injurious overloads to the motor upon the return of voltage after voltage failure.

Second. The magnetic switch can be held closely to the arm on any accelerating step only by holding in a push button. This prevents leaving any of the starting resistance permanently in circuit, and thereby burning out this resistance.

Third. The magnetic switch will maintain itself closed only when the arm is at the full on position.

The resistance, fingers, contacts, etc., used are of the same design and kind of material that the makers use in controllers for heavy service.

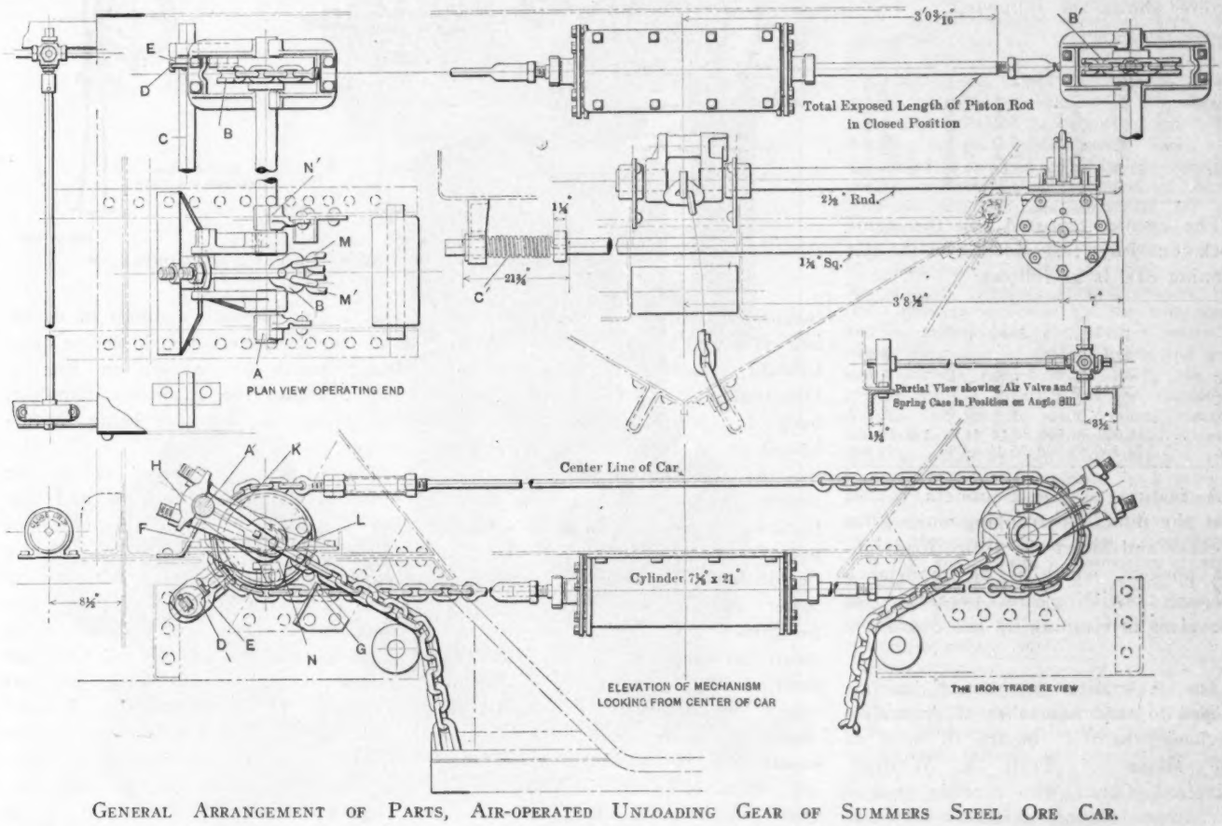
THE APPLICATION OF AIR IN THE UNLOADING OF STEEL ORE CARS.

Rapid unloading of iron ore cars has been considerably facilitated by the recent adoption of air in the operation of the devices controlling the opening and closing of the bottom doors. Some of the well known types of steel cars now in use in the Lake Superior region have been equipped with pneumatic mechanism and are now affording satisfactory results in the dispatch with which they are cleared of their burden.

One of the latest applications of air to the ore car is that designed by the Summers Steel Car Co., Pittsburg, and described in THE IRON TRADE REVIEW January 28, 1909. This company recently supplied the Duluth & Iron Range Railroad with 800 of its patented steel cars, which were provided with a worm gear attachment for operating the bottom doors. Some of these cars have since been equipped with the company's new air mechanism so that their unloading may now be done either by this means or by hand, through the gear arrangement.

Under the Summers device the air is used for both the opening and the closing of the doors. This mechanism is inoperative at any other time, as the doors are held in a closed position mechanically and in addition have an automatic locking apparatus which prevents them from coming open by accident or being dropped by meddlesome persons.

At each end of the car and at right angles to the bottom doors is located a rotating shaft to which is keyed a double-arm center crank. Swinging on the crank pin is a U bolt which serves as a connecting link between the operating shaft and the chains by which the bottom doors are hung. When the crank is at a dead center at the upper end of a 180-degree revolution of the shaft, the doors are in a closed position. The shafts are simultaneously rotated from a power cylinder 7½ inches in diameter and with a 21-inch stroke which is secured at one side of the door opening to the bottom of the triangular girder formed by the sloping side hopper sheet, side sheet and horizontal connecting sheet. This cylinder is provided with a single piston rod projecting through both ends of the cylinder and having connected at each end a chain which passes around the chain wheels, forming substantially a belt. The chain and connecting rod together with the piston rod of the cylinder form in effect an endless flexible belt passing around the chain wheels at the two ends of the car. This belt serves to simultaneously rotate both wheels and shafts connected thereto and produce coincident movement at both ends of the door. When the air is applied the double arm cranks are thrown off center, a 180-degree revolution of the shaft takes place and the doors drop, leaving the load to escape by gravity. The air is required only at the beginning of the stroke in dropping the doors or just sufficiently to move the cranks from a dead center position. A half turn of the shaft pulls the locking dog free of the chain wheel and permits


Total Exposed Length of Piston Rod in Closed Position
2½" Rnd.
1¾" Sq.
PLAN VIEW OPERATING END
Partial View showing Air Valve and Spring Case in Position on Angle Sill
Center Line of Car
Cylinder 7½" x 21"
ELEVATION OF MECHANISM LOOKING FROM CENTER OF CAR
THE IRON TRADE REVIEW

GENERAL ARRANGEMENT OF PARTS, AIR-OPERATED UNLOADING GEAR OF SUMMERS STEEL ORE CAR.

A—center crank; B—chain sheave with locking cam; B¹—chain sheave without locking cam; C—locking shaft; C¹—torsion spring to automatically operate locking dog; D—eccentric; E—locking dog; F—stop in closed position; G—stop in open position; H—cap for U-bolt; K—U-bolt; L—three-cornered link; M and M¹—chain to doors; N—center crank bearing.

the latter to revolve when the cranks are thrown off center by the air. In closing the doors the air is required for the full stroke of the cylinder, causing the reverse movement of the shaft. The rotation of the cranks is limited at the upper end of the stroke just at the point when the cranks have reached a dead center, or have passed it slightly through their coming in contact with a fixed stop in the body of the car.

As the closing of the doors takes place simultaneously with the cranks approaching the dead center when they exert a maximum pull, a very positive closing device is effected and sufficient power is available to break up any ordinary substances which may have become lodged between the doors. The closing of the doors is accompanied by a snapping into a locked position which clearly indicates a shut aperture.

A high rate of unloading speed has been attained through the use of the pneumatic device in experiments conducted at Two Harbors on the Duluth & Iron Range Railroad and at Duluth on the Duluth, Missabe & Northern Railroad. An official record of an unloading test with the Summers car at the docks of the Duluth, Missabe & Northern Railway Co. at Duluth July 10, the ore being of an easy running nature, shows the following:

Unloading device.	Light weight.	Weight of ore.	Per cent pay tons.	No. ft. door opening.	Total time consumed.
Gear	31,000	86,000	73.50	44.90	1 m. 24 sec.
Air	31,300	85,900	73.29	44.90	14 sec.

The record reported for the same dock on July 13, working with fair running ore, is as follows:

Unloading device.	Light weight.	Weight of ore.	Per cent pay tons.	No. ft. door opening.	Total time consumed.
Gear	31,000	98,560	76.12	44.90	2 m. 14 sec.
Air	31,300	99,900	76.31	44.90	12 sec.

A feature of the Summers car is that the doors in dropping open form a chute and direct the entire load into the pockets, which is of importance through obviating the necessity for shovelers in cleaning up the operation.

The Australian government has arranged to send a number of Australian mechanics to this country to work in the shops of Pratt & Whitney, Hartford, Conn., who recently secured a contract to equip a factory for making small arms for the Australian government in Australia.

THE WESTINGHOUSE-LEBLANC CONDENSER.

The introduction of the steam turbine not only made possible the utilization of high vacuum, which was denied the reciprocating engine, but the economic standing of the turbine depended upon high vacuum being available. The same obstacles which prevented the reciprocating engine from reaping the advantage due to improved vacuum also stood in the way of its production, that is to say, reciprocating action in the air pumps. Many efforts have been made and many modifications introduced in the hope of betterment, and excellent results have been obtained, but at the expense of complication, and the apparatus required for handling the attenuated vapors was relatively large and costly. It is claimed that the Leblanc condenser, made by the Westinghouse Machine Co., E. Pittsburg, Pa., eliminates the defects inherent in a reciprocating mechanism by the substitution of a form of rotary pump. One of the striking features of the apparatus is its compactness and simplicity. While it accomplishes the separate removal of water and air, these functions are performed by a pair of relatively small turbine type rotors on a common shaft in a single unit casing, which is integral with or attached directly to the lower portion of the condensing chamber. The condensing chamber itself is comparatively small in volume, being in fact but little more than an enlargement of the exhaust pipe. A general sectional view of the Leblanc condenser is shown in Fig. I. Exhaust steam enters at either D or R, and the injection water entering through pipe A is projected downwards through the spray nozzle marked B. The combined injection water and condensed steam flow to the centrifugal discharge pump M under a head of two or three feet, which insures positively the filling of the pump. The exhaust steam is drawn downward and condensed by the water spray, and the space E above the water level in the condensing chamber is occupied by water vapor, plus the air which entered with the injection and with the exhaust steam, and this space communicates with the air pump N through the pipe K.

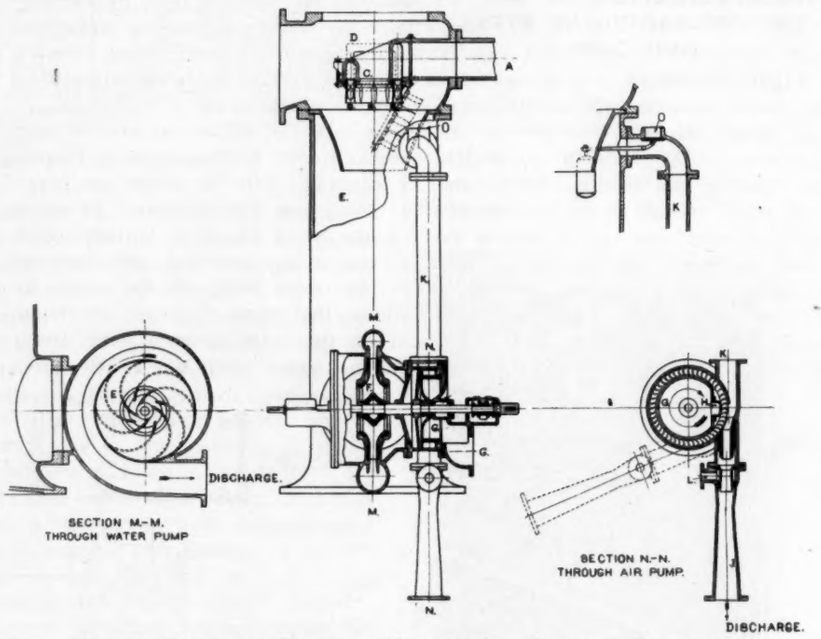


FIG. 1—SECTIONAL VIEW OF WESTINGHOUSE-LEBLANC CONDENSER.

Fig. 1 also shows air pump in detail, and the impellers of both air and water pump are shown in Fig. 2. Fig. 3 shows the apparatus complete, the pumps in this case being motor-driven.

The principle employed in the air pump is claimed to be new, and that the pump differs from all pumps of the ejector type in that the vanes in traversing the discharge nozzle at high speed constitute a series of pistons, each one of which forces ahead of it a small pocket of air, the high velocity of which effectually prevents its return to the condenser. A small quantity of water is supplied to the suction side of the air pump to assist in the performance of its functions. The water supply enters at G an annular chamber which is overhung by the buckets on air pump rotor.

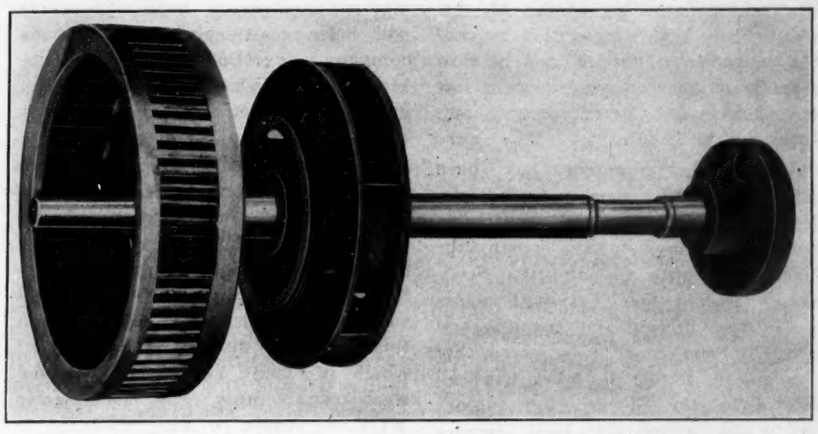


FIG. 2—DETAIL OF WESTINGHOUSE-LEBLANC PUMP IMPELLERS.

The water passes out through the port H and is projected downward by the action of the vanes or water pistons. At the lower end of the air pump nozzle is located an auxiliary ejector nozzle L, to which is connected a steam pipe for use in forming a partial vacuum in starting up, in case the water supply to the air pump has to be lifted. If, however, the source of supply is above the air pump, the ejector is not required. For surface condensers, barometric jet condensers, evaporating pans, etc., the air pump is furnished separately.

Tests of the Leblanc condenser are said to have shown an efficiency higher than 99 per cent. The power required for the pumps is said to approximate 2 to 3 per cent of the power generated by the main engine.

The Westinghouse Machine Co. says that although this apparatus has only been on the market about a year, there has already been built or contracted for over 75,000 horsepower in capacity, almost all of which is for use in connection with steam turbines.

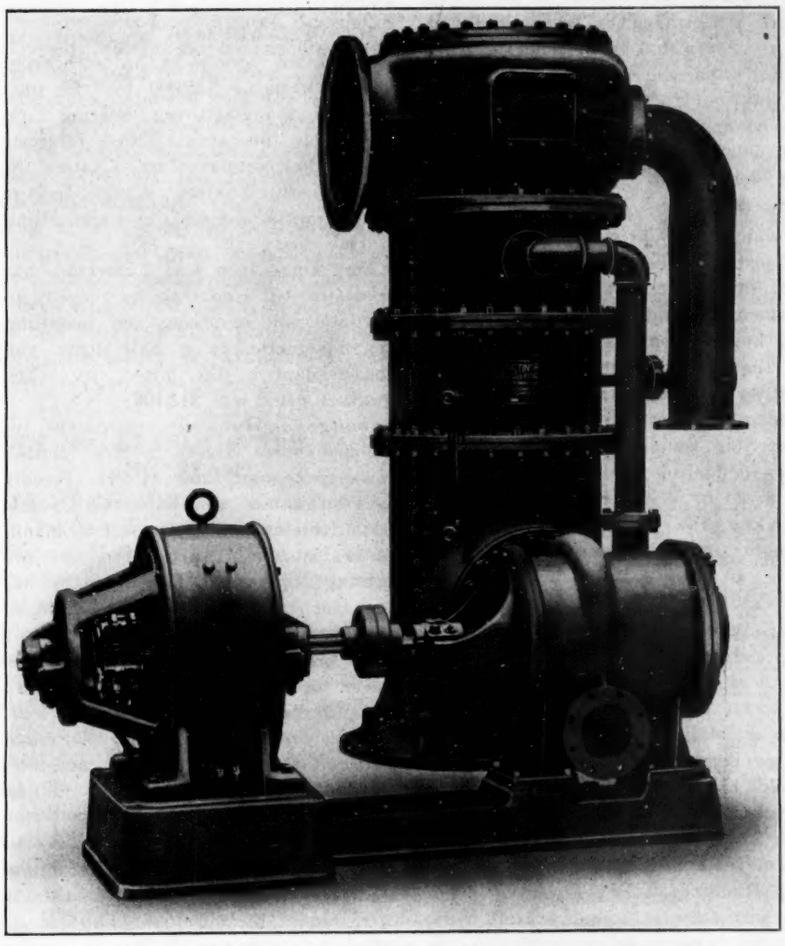


FIG. 3—GENERAL VIEW OF WESTINGHOUSE-LEBLANC CONDENSING APPARATUS.

TRADE PUBLICATIONS.

THE PROTECTION OF IRON AND STEEL.—The Glidden Varnish Co., Cleveland, O., is distributing a little booklet with the above title, setting forth the merits of its acid proof coatings for iron and steel structures.

STEAM SPECIALTIES.—Catalog No. 16 of the Steam Appliance Co., Milwaukee, Wis., contains cuts and tables of dimensions of steam and oil separators in the horizontal, vertical and receiver types, steam traps and pressure regulators made by them.

STEEL FURNITURE.—The Berger Mfg. Co., Canton, O., has issued a 72-page 6 x 9-inch catalog descriptive of its steel office furniture, which includes cabinets, filing cases, wardrobes, sectional bookcases, etc.

CORE OVENS.—The J. D. Smith Foundry Supply Co., Cleveland, is distributing a 20-page 6 x 9-inch catalog descriptive of its various types of core ovens and core oven appliances for foundry use.

FLEXIBLE GEARING.—Under the above title, the Morris Chain Co., Ithaca, N. Y., has sent out its bulletin No. 8, 34 6 x 9-inch pages descriptive of its silent chain, with numerous illustrations of its application to shaft drives, machine tools, generators, motors, fans, grinders, etc.

ELECTRIC APPLIANCES.—The General Electric Co. in its bulletin 4675 describes and illustrates a new single-phase induction motor of the repulsion induction type, designated as Type "RI," and developed by the General Electric Co. for use in connection with installations where the starting torque of the resistance reactance type of induction motor will not meet the demand of the driven machine, or where within certain limits variable speed is required. The bulletin mentions various applications of this type of motor, illustrates and describes controllers for use in starting and controlling the speed, and contains certain other data including diagrams of connections. Bulletin 4674 describes and illustrates its polyphase induction motors and the controlling apparatus for use with them, and in folders 3846 and 3847 it refers to voltage regulation of feeder circuits and generator circuits and describes briefly the apparatus used in accomplishing the regulation. Bulletin 4677 by the same company contains data relative to the Sprague-General Electric Type M system of control, and forms a revision of similar data contained in a previous bulletin on this subject. The publication contains numerous illustrations showing the various pieces of apparatus used in connection with this system, with a description of each. It also contains a table of weights of this style of equipment for various horsepower capacities. The bulletin is one of general interest to railway men.

FURNACES.—The Rockwell Furnace Co., 26 Cortlandt street, New York, is distributing an 11½ x 16-inch 12-page catalog containing profuse illustrations of various operations of the Rockwell furnaces, and also includes illustrations of its general offices. The furnace illustrations include furnaces for flue welding, die work, cores, rivet heating, melting, annealing and tempering, enameling, case hardening, etc., in fact almost every use to which furnaces are applied.

BRITISH NOTES.

Large Order for Rails—Contract for Rebuilding Spanish Navy.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, England, July 17.

Trade recovery is very slow. In Sheffield, for example, a meeting was held yesterday to consider how best to deal with the 7,000 unemployed still reported in that city. In Middlesbrough conditions are almost as bad. The rail mills are not particularly well off for work, but a large order has been received this week by Bolckow & Co., Middlesbrough, for 25,000 tons for the Transvaal government. New South Wales is in the market for 12,500 tons.

A meeting of the Gas Strip Association was held in Birmingham on Thursday, when the present official price of £6-5 to £6-7-6d was confirmed. The collapse of the Galvanized Sheet Association was the main topic of conversation at the Birmingham meeting. Its immediate effect was to drop prices from £12-10 to £11 per ton, while in one case they were offered as low as £10. When it was formed four years ago, the price of galvanized corrugated sheets was about £10 per ton, but before the end of the year the selling price was raised to £12-2-6d, and, during the prosperity of 1907, the high level of £13-17-6d was reached. Since January, 1908, the prices remain at £12-10, though the general conditions of trade have forced reductions in all other classes of iron.

The country expects to benefit very considerably by the building of the new Spanish navy, for which a contract was completed and signed this week at Madrid between the Spanish government and a British syndicate. The new navy is to cost seven millions sterling, and comprises 34 battleships, gunboats and destroyers and torpedo boats. The British firms favored are Armstrong, Whitworth & Co., Ltd., John Brown & Co., Ltd., and Vickers, Son & Maxim. A large amount of the work must be done in Spain, but a great deal of the equipment will be furnished from this country. Naturally, the Spanish contract is being used as a means of spurring on the British government to complete its naval program, and set the British yards fully at work.

The unrest of last year between capital and labor has left its mark upon the returns just issued by the board of trade. The industrial disturbance was greater than for the past ten years. Three disputes in the engineering, ship building and cotton industries were responsible for throwing idle 160,000 workpeople, and the loss of 8,250,000 working days; but of the 329 disputes, 70 per cent were settled by conciliation or by arbitration, and in most cases the permanent result was to set up machinery which will prevent outbreaks in the future.

Considerable comment has been aroused in British iron and steel circles by the equipment of two important undertakings in the north, the Barrow Hematite Co. and the Frodingham Iron & Steel Co., with plants of German design and manufacture. In the former case, it is stated that a saving of £1,000 per week has been effected by the German gas engines put in to utilize the blast furnace waste gas. Alfred Hickman & Co., of Wolverhampton, however, in reorganizing their mills by the installation of electrical driving and of engines for the utilization of furnace gas have confined their patronage entirely to English manufacturers. A suggestion that Sir Alfred Hickman sacrificed business interests to patriotic considerations in adopting this course is indignantly repudiated by him. He states that the difficulty incidental to new departures in his case have been far less than those attending the somewhat similar installation in the north, where a German firm was employed. He considers that in the end the work at his mills will prove fully equal if not superior to anything the Germans have done, and the cost, he is satisfied, will certainly not be greater than they would have charged.

The firm of Francis Withy & Co., of which Sir Christopher Furness is the principal, reports satisfactory results during the past year in every department, except ship building. The ship building yard shows a loss during the first six months of £59,134. That is the business which was disposed of during the year to the Irvines Ship Building & Dry Docks Co. After deducting the loss of £59,134, the profit of Withy & Co. for the year, including the balance of £102,315 brought forward from the previous year, is £381,031, compared with £309,230 in the previous year. The company has paid an interim dividend of 5 per cent on the ordinary shares and it is proposed to pay a further 5 per cent, making 5 per cent for the year in addition to the dividend on the preference shares, leaving a sum of £88,132 to be carried forward. The directors express great satisfaction with the results of the co-partnery scheme in connection with the Irvines Ship Building & Dry Dock Co. The relations between employers and workmen are most harmonious and the directors have every hope that there will be a reasonable return on the company's investment instead of the serious loss, which that department has hitherto been to them.

The statement of exports to the United States from the Birmingham district for the last three months, issued by the United States consul, shows considerable increase over the preceding quarter and over the corresponding quarter of 1908. The total value of the declared exports from this consular district, the bulk of which, of course, consists of iron and steel manufactures, was last quarter £171,596, compared with £120,353 in the second quarter of last year, an increase of £51,243, or 42.50 per cent. The ratio of increase is greater from Birmingham itself than from other parts of the district. The exports to the United States from Birmingham alone are returned at £136,323, as against £88,486 in the same quarter of last year, this being an increase of £47,837, or 56.3 per cent.

INDIANAPOLIS.

Structural Fabricators Busy—New Manufacturing Enterprises.

Indianapolis, Aug. 3.—The Smith System Co. has been organized and incorporated here with an authorized capitalization of $25,000 for the purpose of manufacturing heating and ventilating apparatus. Those interested in the company are Charles N. Hunt, North Yakima, Wash.; George D. Carrington and Charles Leigh Hunt, of this city.

The Ames Iron Co., Cleveland, has been awarded a contract by the city of Portland for supplying and installing the equipment of a new light and power plant in the latter city. The contract price was $12,105.

George C. Hitt, receiver for the Indianapolis *Star*, Harry S. New, former newspaper man, and H. H. Friedly have organized the Universal Nozzle Co. in this city They expect to manufacture nozzles, sprinklers and fire fighting apparatus. The company has been incorporated with an authorized capitalization of $12,000.

An order for ash pans has been received by the Atlas Locomotive Ash Pan Co., recently organized at Fort Wayne, from the Chicago Terminal Railroad Co. All of the locomotives of the latter company are to be equipped with ash pans.

The Brown-Ketcham Iron Works will soon begin work on the structural steel to be used in the construction of the new Murat Temple. The general contract was let to A. Von Spreckle-

son at $229,000, who awarded the subcontract for the steel to the iron works.

The Victor Manufacturing Co. will manufacture a combination lifting jack and wire stretcher at Bloomfield as soon as a suitable plant can be established. The company has $25,000 capital, with John A. Phillips, J. F. Slinkard and L. J. Phillips as directors

TREADWELL CONSTRUCTION CO.

The Treadwell Construction Co. has been incorporated with $100,000 capital and has acquired the plant formerly occupied by the Rust Boiler Co., Midland, Beaver county, Pa. This concern has been organized by the same interests that are represented by the M. H. Treadwell Co., of New York, Chicago, and Lebanon, Pa. The plant acquired is located on a site of 27 acres fronting on the Ohio river, and transportation facilities are provided by the C. & P. division of the Pennsylvania railroad. The buildings consist of a modernly equipped structural steel shop, 416 x 100 feet, served by a 20-ton electric traveling crane, having a 75-foot span. The power plant is equipped with Rust boilers, engines, direct-connected dynamo, hydraulic pump, air compressor and accumulator. The tools used by the Rust Boiler Co. have been removed and the shop is being re-equipped with machine tools of the latest design, and of large and heavy type for the manufacture of plate and structural work. The company is equipping to undertake the construction of blast furnaces, tanks, bins, water towers, stand pipes, stacks, boilers and, in particular, crooked and difficult kinds of steel plate construction work. Paul W. Webster is vice president and general manager.

NEW MALLEABLE STEEL CASTING PLANT.

The Buhl Malleable Co., Detroit, has taken over the contracts of the Western Malleable Steel Co., of that city, for malleable steel castings, and has made arrangements to fill these orders, as well as the current tonnage for these castings at that plant for 60 days. At the expiration of this period a new foundry adjoining the Buhl Malleable Co.'s plant will be completed, consisting of two buildings, 90 x 115 feet and 62 x 280 feet, respectively. Malleable steel castings, after Oct. 1, will be made in this new plant, and by this arrangement the customers of the Western Malleable Steel Co. will not be inconvenienced. J. P. McManus, who has had a wide experience in steel works at Sharon, Pa., and has recently been with the Malleable Steel Casting Co., will have charge of the malleable steel casting department of the Buhl company.

LAKE SUPERIOR MINING INSTITUTE.

The annual meeting of the Lake Superior Mining Institute will be held on the Marquette range, Aug. 25 to 28. Headquarters will be established at the Nelson House, Ishpeming, Mich., and Wednesday, Aug. 25, will be spent at this place with a business session in the evening. On Thursday, the members will visit Negaunee, Marquette and Munising, a business session being held at the latter place. Friday, Aug. 27, will be spend at Munising, Grand Island and at the new mines in the Swanzy district, returning to Ishpeming in time to meet the south and west bound trains. Members desiring to go underground on Saturday can make arrangements by applying to the secretary upon their arrival at Ishpeming. A partial list of papers to be presented at this meeting follows:

"How Reforestation May be Applied to the Mine Timber Industry," by Thomas B. Wyman, Munising, Mich.
"Mine Accidents," by John T. Quine, Ishpeming, Mich.
"The Sociological Side of the Mining Industry," by W. H. Moulton, Ishpeming, Mich.
"Biographical Notes," by J. H. Hearding, Duluth.
"Reminiscences of the Early Days on the Marquette Range," by George P. Cummings, Marquette, Mich.
"Historical Sketch of Copper Mining on Lake Superior," by Alfred Meads, Marquette, Mich.
"Code of Mine Signals, Cleveland-Cliffs Iron Co.," by O. D. McClure, Ishpeming, Mich.
"Capillary Attraction in Diamond Drill Test Tubes," by J. E. Jopling, Ishpeming, Mich.
"Sinking Reinforced Concrete Shafts Through Quicksand," by Frederick W. Adgate, Chicago.

NATIONAL ROLL & FOUNDRY CO.

The National Roll & Foundry Co., with offices in the Farmers Bank building, Pittsburg, has been recently organized and has purchased a roll foundry and machine shop at Avonmore, Pa. The plant is now in shape for active operation. The personnel of the new company embraces men experienced in iron and steel manufacture. J. B. Baird, president and general manager, was formerly engaged in the tin plate and sheet steel business and has recently been associated with the Canton Roll & Machinery Co., Canton, O.; R. A. McKinney, secretary, was formerly purchasing agent of the American Sheet & Tin Plate Co., Pittsburg; C. W. A. Koelkenbeck, who at various times has been connected with the Garrett-Cromwell Engineering Co., Cleveland, Wellman-Seaver-Morgan Co., Cleveland, Julian Kennedy, Pittsburg, and the Tennessee Coal, Iron & Railroad Co., will serve as chief engineer; W. T. Simpson, of Cincinnati, will be vice president. W. H. Melaney, until recently connected with the Geo. A. Hogg Iron & Steel Foundry Co., Pittsburg, has also become associated with this concern. The new company proposes to manufacture sand and chilled rolls, pinions, rolling mills, plate glass and paper mill machinery, and all classes of heavy iron castings. The plant acquired is well fitted for this line of work. It consists of a foundry, 50 x 246 feet, with a two-story lean-to, 40 x 150 feet, containing two 15-ton air furnaces and two 50-ton cupolas, as well as a machine shop, 50 x 278 feet, including an erecting room.

PITTSBURG'S ENORMOUS FREIGHT TONNAGE.

While the tonnage of freight moved from the city of Pittsburg during 1908 showed a sharp decline over the preceding year, the decrease has not been as large as was generally expected. A report of the freight movement has just been issued by the traffic department of the Pittsburg chamber of commerce. This shows the following comparison of the city's tonnage of the years 1908 and 1907 in gross tons:

	1907.	1908.
By rail	146,798,351	104,500,508
By river	14,395,816	11,454,895
Total	161,194,167	115,955,403
Decrease in 1908		45,238,764

GERMAN STEEL TRADE QUIET.

Pig Iron and Coke Again Decline.

Dusseldorf, Germany, July 17.—Unfavorable reports are being received from the iron and steel producing centers, although the Stahlwerksverband during the month of June showed a slight increase of output as compared with May, and about 75 per cent of capacity is operating. Blast furnace coke has been reduced from $4.40 to $4.05, but this decline is insufficient to stimulate the demand. Pig iron for 1909 delivery is lower, Westfalian hematite being quoted at about M. 54 ($12.90) per thousand kilograms. There is little demand for railway material inasmuch as the construction of the state railways, commenced about five years ago, has now been completed. Export tonnage is taken at very low prices, especially in competition with the works in southern Russia. The demand for wire products is good, but bar iron and plates are moving slowly and prices are declining.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The Leibovitz & Stark East New York Cornice Works, Brooklyn, has been incorporated with $2,000 capital stock to manufacture structural, ornamental and architectural iron work. The incorporators are Michael Leibovitz, 5 Ames street; Adolph Stark, 1503 Eastern parkway; Isidor Leibovitz, 27 Glenmore avenue; all of Brooklyn.

The Cartin Perfect Combustion Co., has been incorporated at Ogdensburg, N. Y., to manufacture the Cartin boiler. John Cartin, Ogdensburg, has been elected president, John Barr secretary and treasurer, and John J. Sovie, Philip Cartin, J. Cavanaugh, Frank Cartin and Edward J. Burns, directors. The capital stock is $50,000.

Articles of incorporation have been filed by the Dayton Engineering Laboratories Co., Dayton, O. The company will manufacture electrical and mechanical appliances and chemical products; capital, $150,000. George W. Shroyer, Ellis P. Legler, Charles R. Nevin, H. H. McGrew and Benjamin F. McGann are the incorporators.

Articles of incorporation have been filed by the Henderson Engineering & Sales Co., New York City, to engage in the manufacture of foundry machinery. Henry Henderson, 12 Lexington avenue; Burt D. Powleson, 620 West 116th street, and Chandler D. Oakes, 50 Pine street, all of New York, are the incorporators.

The Reliance Auto Parts Co., New York City, has incorporated with $20,000 capital, to manufacture cars, carriages, boats, motors, engines, etc. The incorporators are Herman L. Wilkins, Johanna H. Wilkins, 211 West Fortieth street, and Warren R. Schaut, 38 West Eighteenth street, all of New York.

The Meacham Addressing Machine Co., New York City, has been incorporated to manufacture addressing, stamping, embossing, marking, printing and counting machines, with $3,000 capital. Those interested are George W. Meacham, S. N. Lovelace, H. Ford Moffatt, all of 90 Broadway, New York City.

The Stephenson Pump Co., St. Louis, manufacturer and dealer in pumps, has been chartered with $10,000 capital, by Albert H. Lowe, Guy Stephenson, of St. Louis, and Charles H. Stephenson, Carlisle, Ill., Homer A. Stephenson and John B. Denvir Jr., St. Louis.

The United States Calibrating Co., New York City, has been incorporated to manufacture machinery, tools and scientific instruments; capital, $12,500; incorporators: William L. Tucker, 135 Broadway, M. G. O'Donnell, 141 Broadway, and Thomas F. Seelye, 141 Broadway, New York City.

Articles of incorporation have been filed by the Imperial Motor Car Co., Hamilton, O., $500,000 capital, to manufacture motors and automobiles. G. A. Rentschler, George H. Helvey, Fred B. Rentschler, C. U. Carpenter and George Stanley Helvey are the directors.

The Cambridge Iron Works, Cambridge, Mass., has been incorporated with $25,000 capital. Officers: President, John C. Dow, 14 Chatham street, Boston; treasurer, Robert C. Bird, 92 Broadway, Cambridge; clerk, William K. Campbell, 212 Sixth street, East Cambridge, Mass.

A certificate of incorporation has been granted to the Marvel Motor Cycle Co., Hammondsport, N. Y., to manufacture motors, motor cycles and supplies therefor, with $50,000 capital. The incorporators are C. Leonard Waters, Glenn H. Curtis, Elizabeth Waters, Hammondsport, N. Y.

The Luitweiler Pumping Engine Co., Rochester, N. Y., has been incorporated to manufacture pumps, machinery, engines and automobiles; capital, $300,000. S. W. Luitweiler, W. C. Smith, J. G. Haap and G. W. Rich, Rochester, N. Y., are the incorporators.

The Malleable Equipment & Mfg. Co., Toledo, O., incorporated by William Coughlin, E. F. Abbey, Paul J. Ragan, D. E. Holland and A. F. Connelly, will place on the market a patent charging truck for use in foundries. The capital stock is $10,000.

The Bi-Motor Equipment Co., Boston, has been incorporated to engage in the manufacture of motors, with $50,000 capital. President, Fred A. Putnam, 22 Lincoln street, Boston; treasurer and clerk, John V. Wilson, 24 Lincoln street, Boston.

The Model Metal Work & Mfg. Co., Cincinnati, $10,000 capital, has filed articles of incorporation to make metal specialties and patterns. Charles Pieper, Herbert H. Gerding, Ernest Rehm, Louisa Gerding and Arthur W. Mueller are the incorporators.

The Saurer Motor Truck Co., West Orange, N. Y., capital $200,000, has incorporated to manufacture motors, engines and machinery. The incorporators are W. D. Sargent, West Orange; G. M. Judd and E. H. Fallows, New York City.

The Campbell Electric Co., Lynn, Mass., has been incorporated to manufacture electric motors; capital stock, $20,000. Officers: President, Charles E. Campbell, 74 Jefferson street, Lynn, and treasurer, Fred R. Campbell, 74 Jefferson street, Lynn.

The Golden Mfg. Co., Fremont, O., has been incorporated with $25,000 capital stock to engage in the manufacture of cutlery. Will E. Golden, H. R. Wade, W. H. Meince, C. C. Tunnington and J. T. Kuppinger are the incorporators.

The New Process Galvanizing Co., Rochester, has been incorporated with $15,000 capital, and will erect a galvanizing plant. Frank M. Harris and Murray B. Harris, Lowell, Mass., and Claire C. Bateman, Scottsburg, N. Y., are the incorporators.

The Automatic Picture Machine Co., New York City, has been chartered with an authorized capital of $50,000. Those interested are John L. Phillips, Samuel H. Weil, Joseph Weil, all of Room 318, Produce Exchange, New York City.

The Protector Coin Slot Machine Co., Chicago, manufacturer of slot machines, has been incorporated with $5,000 capital stock. The incorporators are William B. Miller, 1208 Heyworth building, Fred Klineman and Emily F. Jordan, Chicago.

The Gas & Electric Appliance Co., St. Louis, has been chartered to manufacture gas and electric appliances. The capital stock is $20,000, and the incorporators are Oliver H. Tyfe, Joseph S. Lehman and Irwin Lehman.

K. I. Herman Machinery Co., Chicago, has been granted articles of incorporation, and will manufacture and deal in builders' and mill supplies. K. I. Herman, George J. Krock and B. M. Krock are the incorporators.

The Warner Engine Co., Muncie, Ind., has filed articles of incorporation with $50,000 capital. The directors are Dee O. Skillen, Hugh L. Warner, John F. Warner, Thomas W. Warner and E. W. Skillen.

The Finkbeiner Turney Co., Freeport, Ill., has incorporated with $25,000 capital, to manufacture engines

and electrical supplies, by J. C. Finkbeiner, F. L. Turner and E. J. Kane.

The U. S. Ball Bearing Mfg. Co., 112 Clark street, Chicago, has incorporated with $50,000 capital. The incorporators are Fritz Henzelman, Carl Rathert and John W. Utesch.

Burton W. Mudge & Co., Chicago, $50,000 capital stock, have been chartered to manufacture railway supplies. B. W. Mudge, C. C. Roe and E. C. Wood are the incorporators.

The Henderson Iron Works, Jersey City, N. J., has been granted a certificate of incorporation, with $5,000 capital. J. and A. Henderson, Jersey City, are the incorporators.

The Pinnell Stove Co., Sikeston, Mo., has been chartered with $10,000 capital. N. C. Holley, C. C. Pinnell, David Dickworth and others are the incorporators.

The Culm Furnace Construction Co., Philadelphia, $450,000 capital, has been incorporated by F. R. Hansell, G. H. B. Martin, S. C. Seymour, Philadelphia.

The Milwaukee Storm Valve & Trap Co., Milwaukee, $5,000 capital, has been incorporated by Willibald Hoffman, Henry C. Williams and Fred C. Mitchell.

The Crawford Machine Co., Boston, has been incorporated to operate a machine shop, with $5,000 capital. President and treasurer, Robert S. Crawford.

The Western Iron Stove Co., Milwaukee, has been incorporated with $100,000 capital by John H. Hurley, Charles E. Munroe and S. C. Hauxhurst.

The Chicago Brewers Machinery & Supply Co., Chicago, capitalized at $20,000, has been incorporated by A. V. Coldby, F. J. Drauben and Otto Buss.

New Construction:—

The Ohio Steam Specialty Co., Struthers, O., which has just filed articles of incorporation, announces that in September it expects to break ground for a factory in Struthers on the line of the Pennsylvania railroad, where it will make boiler tube cleaners, steam traps and valves. The company is incorporated by B. A. Andrews, F. J. McDevitt, James McDevitt, J. V. Murphy and George Winsor.

Officials of the Puget Sound Iron & Steel Works, Tacoma, Wash., announce that the company will build a marine railway and ship yard near the new works of the company on the Puyallup river. A part of the product of the yard will be steel vessels. The company now has a foundry and machine shop under construction which will cost about $100,000.

The Bettendorf Axle Co., Davenport, Ia., is about to build an extension to its main shop, 256 x 1,400 feet, which will make the entire building 2,100 feet long. The extension is to be used as an erecting shop and will contain considerable machinery, including a number of electric traveling cranes.

The Northern Pacific railroad announces through its mechanical superintendent, W. A. Moir, that work will be begun this year on a foundry to be operated in connection with its other shops at Brainerd, Minn. The new building will be double the size of the present foundry at Brainerd.

The Flint, Mich., plant of the General Motors Co. is now being enlarged by the construction of an extensive building to be used for the manufacture of gasoline engines. It is expected that the building will be ready for the installation of machinery by Oct. 1.

The officials of the Carnegie Steel Co., Sharon, Pa., have asked the council to vacate one block of Franklin street in that city to make room for new construction which will unite two of the company's properties.

The International & Great Northern railroad, Houston, Tex., has plans for a machine shop, blacksmith shop and other buildings to be erected at Taylor, Tex.

Frank B. Thurber, Tecumseh, Neb., has leased property there and proposes to install a machine shop in which he will make a specialty of engine and automobile repairs.

The Jeffrey Mfg. Co., Columbus, O., has taken out a permit to build a warehouse, 200 x 100 feet, for the storage of machinery and loading appliances.

Work has been begun on a machine shop for the Santa Fe railroad at Wellington, Kan. It will be 80 x 150 feet. A car repair shop is also to be built.

Work is now in progress on an addition to the Cook-Lewis Foundry Co., Salem, N. C., which will enable the company to double its capacity.

The Wheeling Metal & Mfg. Co., Wheeling, W. Va., has let contracts for the construction of a factory building.

The Peteler Car Works, Minneapolis, Minn., has plans for extensive alterations to its plant.

The Machine & Foundry Co., Brazil, Ind., has decided to erect a new foundry.

General Industrial:—

The Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, reports a heavy demand for cold drawn seamless steel tubing, in large diameters, and the orders now booked insure operation at full capacity for the next six months. Its equipment consists of 42 draw benches, and the plant covers two acres. Among the orders booked are several contracts received from the government for the Panama Canal. Seamless steel tubing as large as 4 inches in diameter is being drawn, and equipment is being installed to draw tubing up to 6 inches in diameter in both tool and low carbon steel.

The Terrell Equipment Co., Detroit, manufacturer of lockers, has added a line of hotel ranges to its product. This concern has recently filled orders for locker compartments from the Valley City Milling Co. and Wolverine Brass Co., and has recently received a contract from the Packard Motor Car Co., Detroit, for 1,000 lockers. The orders recently booked include locker compartments for the American Electrical Heater Works and the Gremmer Mfg. Co., Detroit. The erection of a new plant is contemplated, as the lease of the present buildings will expire in a year.

The Detroit Architectural Iron Works, 224 Twenty-first street, Detroit, recently organized, will engage in the manufacture of plain and ornamental iron work, including fire escapes, stair cases, elevator cabs and cages, grills, wrought iron fences and gates, memorial tablets, bank work, etc. All of the necessary machinery has been installed and the plant is well equipped throughout. A. L. Stewart, president and general manager, was connected with the J. E. Bolles Iron and Wire Works for several years, and during the last five years was in charge of the construction work for that concern.

The Frontier Iron Works, Buffalo, advises that the two-story building which it is now erecting, is to be occupied by the Robertson Drill & Tool Co., controlled by the Frontier company and by the Acme Pattern Works, a firm which makes all the Frontier's patterns. The drill and tool company will be moved from its present plant, 1848 Niagara street, when the building is finished, and will have sufficient machinery to equip the new plant. Later, the Frontier company may be in the market for a few machines to use in boring cylinders.

The Mandt Wagon Co., Stoughton, Wis., a branch of the Moline Plow Works, has under construction a

power house, 50 x 120 feet, of brick and steel construction; a gray iron foundry, 80 x 200 feet, with a 24 x 24-foot cupola room, 36 x 48-foot rattling and grinding room also of brick and steel construction and a woodworking shop, 64 x 66 feet. The company advises that it has provided the equipment necessary for these additions including the complete electrification of the plant.

The McKinnon Chain Co., Buffalo, recently organized, is controlled by the same interests that control the McKinnon Dash Co., Buffalo, and which has for about two years been manufacturing electrically-welded chain in St. Catherines, Ont. The chain company is taking over the already established Canadian business and is building a factory in Buffalo. The chain is made by automatic machinery under patents held by the company.

Howard Greer, Thompson, Greer & Co., Chicago, has been engaged recently on a plan to rehabilitate the Quincy Engine Co., Quincy, Ill. An effort is being made to secure options on the stock but plans for the future, in case of the success of the enterprise, are not announced.

The plant of the Freeland Steel Tank Co., Portage, Wis., has been completed and is now in operation.

The Liberty Mfg. Co., Pittsburg, manufacturer of oil filters, tube cleaners, etc., has bought ground and prepared plans for a two-story steel frame structure, 100 x 105 feet. The addition, which will about double the capacity of the plant, will contain a machine shop and finishing department. The company will need some new machine tools.

The Bettendorf Metal Wheel Co., Davenport, Ia., announces that it has changed its organization from a corporation to a partnership and that the business will be known hereafter as French & Hecht. The same persons who managed the corporation will still be in control of the business both at Davenport and at the Springfield, O., plant.

The Mount Vernon Bridge Co., Mt. Vernon, O., has been awarded the contract by the trustees of the Ohio State University for the erection of a bridge 210 feet long, to permit of the laying of a sidetrack from the Hocking Valley Railroad into the university grounds. The cost of the bridge and track is $37,069.

The National Ventilated Metal Barrel & Crate Co., Van Buren, Ark., states that it will soon be in the market for raw material. The company also expects to establish factories in various parts of the country for the manufacture of its patented devices.

At the annual meeting of the Columbus Chain Co. officers and directors were re-elected. The report of Charles M. Wambaugh, president and treasurer, was satisfactory, and the number of orders booked during July exceeded that of any month during the past two years.

The Hooven-Owens-Rentchler Co., Hamilton, O., has received an order from the Carnegie Steel Co., for a Corliss engine to be used at its Clairton plant. The engine is to be capable of producing 5,000 horsepower and will weigh 800,000 pounds.

Extensive repairs are being made to the Columbus works of the Carnegie Steel Co. The furnaces are being relined, and the mills, engines and other equipment repaired. No definite date has yet been fixed for resuming operations.

The Meurer Bros. Co., New York City, which has manufactured tin and terne plates at Long Island City for a number of years, has opened a new plant at Washington, Pa., where a force of about 80 men will be employed.

The East Chicago plant of the Republic Iron & Steel Co. has resumed operations with a full force of 1,200 men, after running with a reduced force and intermittantly for more then a year.

The Wilkes Rolling Mill Co., Sharon, Pa., is converting its sheet mill into a plant for the manufacture of charcoal iron tin plate. It is expected that it will be running in about six weeks.

The Youngstown Steel Co., Youngstown, O., has bought from J. V. Thompson, Uniontown, Pa., 1,500 acres of coal land in Greene Co., Pa. The price is announced as $550 an acre.

The rod mill operated by the Dillon-Griswold Wire Co., Sterling, Ill., has been sold and shipped to Chicago. The Dillon-Griswold Co. will install a new rod mill of a modern type.

The Gadsden Pipe & Fitting Co., Gadsden, Ala. has placed its shop in operation and has orders for cast iron soil pipe and fitting sufficient for several months ahead.

The Samuel Ridgeway File Co., Gorham, Me., has taken over the Amesbury File Works, Amesbury, Mass., and will consolidate the plants at Gorham.

The Union Malleable Iron Co., East Moline, Ill., has resumed operations after a shut-down for repairs and the installation of new machinery.

The Cutler-Hammer Mfg. Co., Milwaukee, manufacturer of electric controlling devices, announces the opening of a Philadelphia office at room 1207 Commonwealth building.

The Woodward Iron Co., Bessemer, Ala., has begun work overhauling its No. 3 furnace and expects to blow in the stack early in the fall.

The Racine Steel Castings Co., Racine, Wis., has completed an addition to its foundry, 50 x 50 feet, and has installed a new furnace.

The McDonald Machinery & Supply Co. has added about $35,000 worth of new machinery to its plant in Des Moines, Ia.

The Union Welding Co., Chicago, has opened a branch plant in Freeport, Ill.

The North Sharon Works, at Sharon, Pa., of the Carnegie Steel Co., is being placed in operation this week after an idleness since November, 1907. The single blast furnace at this plant was blown in July 12. The company also blew in this week the last stack of its Carrie group and it is now operating 50 of its 59 furnaces or 84¾ per cent. The idle furnaces now are Columbus two, Niles, Steubenville, Zanesville, Neville, one Isabella, Edith, and one Duquesne. The Duquesne stack is under construction and the Edith furnace is being placed in shape for operation. The Carnegie Steel Co. this week also started its new 40-inch blooming mill at its Ohio works, Youngstown, O.

Fires:—

A building recently purchased by the Birmingham Iron Foundry, Derby, Conn., to be used as a part of its plant, was damaged by fire to the extent of $5,000 recently.

Fire in the foundry of the Galusha Stove Co., Rochester, N. Y., on the night of July 2, did about $2,000 damage.

The pattern shop of the West Bergen Iron Foundry, Jersey City, July 22, was damaged by fire to the extent of $7,000.

The tipples, washers, engines and crushers of the Consolidated Coal Co., Searles, Ala., were destroyed by fire July 25. The damage is placed at $100,000.

The foundry of the Quincy Stove Co., Quincy, Ill., was slightly damaged by fire, July 22.

The Pioneer Iron Works, Olympia, Wash., was visited by fire July 20, for the second time within two weeks. The second fire destroyed the pattern shop and some of the company's patterns.